

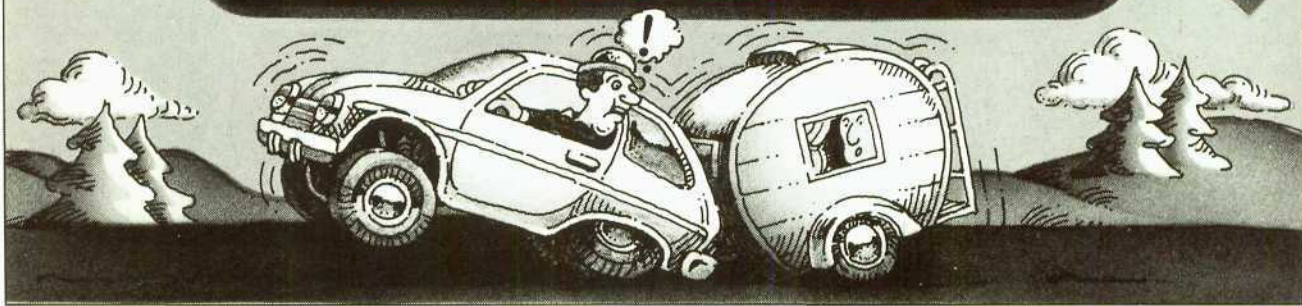
Desert

November, 1981
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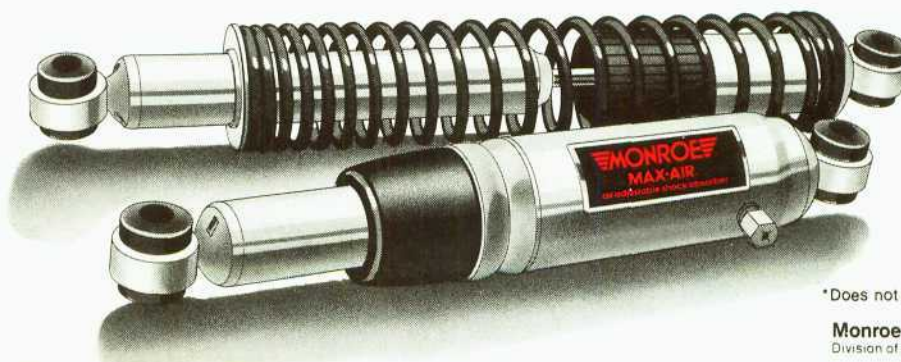
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Desert

MAGAZINE OF THE SOUTHWEST

Community Issue

A Desert Marine Oasis

by Dr. Sherwood B. Idso

They said it couldn't be done . . . but Idso and his family turn an idea into achievement and create an oceanic oasis in the middle of the desert.

page 18

Sedona

by Virginia Greene

There are many interesting "people" communities in the desert. Sedona is only one, but it has a grace and style that sets it apart.

page 22

Bosque del Apache

by Jeff Gnass and
Frances G. Smith

The serenity of a wildlife refuge is hard to match. Spend a day with Gnass, from dawn to dusk, enjoying the inhabitants of Bosque del Apache.

page 32

Death Valley Encampment

by Jack C. Whitt

Join thousands of people who relive the early days of Death Valley every November. The '49ers rise again.

page 36

A Community Affair: The Saguaro

by Karen Sausman

The saguaro, a majestic desert plant, is basically an avian and insect apartment complex. It houses a self-contained community.

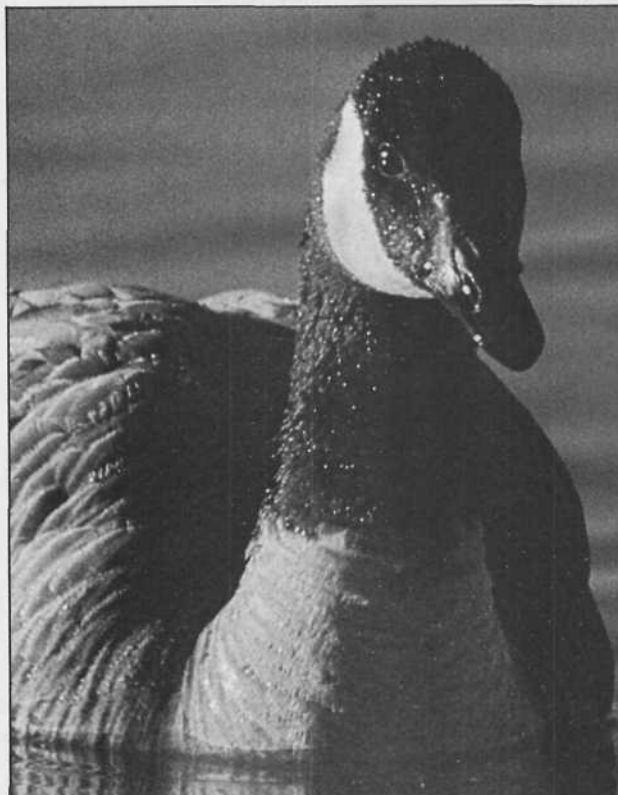
page 38

Sand Dunes

by Wayne P. Armstrong

Sand dunes are far from barren. Armstrong introduces us to a community of plants and animals that inhabit the dunes.

page 42



page 32



page 36

Of Time and the Tiguas

by Joseph Leach

Leach explores an Indian culture and community that has survived the centuries and still thrives near El Paso, Texas.

page 46

Organ Pipe, A Desert Crossroad

by Andrew Steuer III

Seven deserts converge at Organ Pipe National Monument. Steuer takes us through the many faces of this area.

page 56

Departments

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54 Desert Rockhound

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Cover Photo: Potter, Mary Margerite and local historian, Ray Glade enjoy the essence of community: sharing of themselves. Photograph by Alan Benoit.

EDITOR'S LETTER

On Community— Directions, Relations and Details



Ed Seykota

When I was younger I had a paper route. It taught me very little about business, but a lot about people and streets. I can, if I wanted to, still go back to my neighborhood and take you along my old route. I could do it in the same order I used to, and tell you about each of the people I served even though I have forgotten most of the names. From where I sit, I can still describe the

driveways, porches and landscaping. Because I went up and down those streets so often and in all weather, I came to know my neighborhood very well. I was much like the milkman, mailman or neighborhood grocer—I had intimate knowledge of the community and you could count on me for directions. *That* is what community is; knowing the details about the members, their relationships and the directions for traveling among them.

For this issue, I asked contributors to give me something which they knew as well as I knew my streets and customers, to give me something that shows me the theme of community. The results are wonderful. I have human communities to offer you, as well as wildlife, cactus, marine and sand dune communities.

From this emphasis on community, I gained a couple of small but valuable insights. First of all, there is far more intimacy in the world than we realize. We are, in so many ways, connected to and dependent upon natural elements and each other more than we might care to acknowledge. This is something we all know (of course), but it never hurts us to refresh our memories. Second, intimacy is joyous. It is clear that the writers and photographers were much more alive and interested in their work and their subject this time. They were *involved* in what they did. Wayne Armstrong (see page 42) was sliding down *his* dunes. Joseph Leach (page 46) and Virginia Greene (page 22) wrote about *their* neighbors. Sherwood Idso (page 18) wrote about *his* marine oasis (in his own backyard). This is the best kind of communication and the easiest to do once the courage is there.

I sent a lot of community articles back. When they come in again with the intimacy that grows out of personal experience and involvement, I will print them for you.

The point to all the community talk is that we are not alone. There is plenty of intimacy in the desert, and in *Desert* magazine.

Desert

MAGAZINE OF THE SOUTHWEST

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ABC MEMBERSHIP APPLIED FOR 8/19/80
Advertising Information: See Current SRDS, Sec. 30A

Desert Magazine ISSN 0194-3405, is published monthly by Desert Communication Corporation. Editorial and Business Office: 121 West E Street, Encinitas, CA 92024. Telephone (714) 436-4218. Second Class Postage paid at Encinitas, California and at additional offices. Copyright 1981 by *Desert Magazine*. All rights reserved. No part of this publication may be reproduced in any manner without written permission from the Publisher. **Subscription rates** for U.S. and its possessions, Canada and Mexico: 1 year, \$15. Elsewhere: Add \$4 per year surface, \$20 per year air mail (U.S. currency). To **Subscribe, Renew or Change Address**: Write *Desert Magazine*, 121 West E St., Encinitas, CA 92024. Please allow six weeks for processing and include, where applicable, the address label from your most recent copy. Exact zip codes are required by the Post Office. Donors of gift subscriptions should include their own name and address as well as those of the recipient(s). **POSTMASTER: SEND CHANGE OF ADDRESS BY FORM 3579 TO DESERT MAGAZINE, 121 WEST E ST., ENCINITAS, CA 92024.** **Contributions:** The Editor welcomes unsolicited manuscripts and photographs, but they can be returned only if accompanied by S.A.S.E. or international exchange coupons. While we treat submissions with care, we cannot assume responsibility for loss or damage. Payment is upon acceptance. **Writers Guide** free with S.A.S.E.; Sample copy, \$2.00. **Photographers:** Please include technical data with each photograph submitted.

PROJECTIONS



Thom Vollenweider

Dear Reader:

What a privilege to be the publisher of *Desert* magazine! I have a lot of respect for our 44-year-old publication. It has a life and a personality of its own; a rich, complex and warm personality.

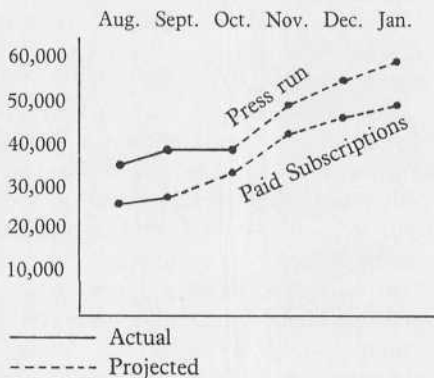
Desert is an integral part of our readers' lives. The average *Desert* subscriber has subscribed faithfully for more than 10 years, and 67 percent of our readers *never* discard their copies.

We just made our first attempt to increase our circulation through direct mail. The results were excellent, and we are planning several other subscription campaigns.

The graph below illustrates the status of our circulation today, August 21 (editorial deadline for the November issue), and gives our projections for the next five months. In the future, you will be able to compare these projections to our actual performance.

Thank you for your support.

Julie Bragan



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The Good and the Bad News

Congratulations! As new editor, we like you and had to tell you. You have a difficult job ahead.

Have someone proofread Ms. Nix. She is a constant source of misinformation (i.e., she said "A man would die in 120-degree temperature without water in three days." We have seen it happen in three hours.).

Keep Choral Pepper coming, she's great. We love her.

Life is short! Why don't you move to the desert, where you belong?

Tell Ed to print his notebook in a service magazine. (No, maybe you better not.)

Tell Joyce Trout that we get used to "walking on fish constantly," especially in the living room. [Letters, Aug., 1981] We liked her letter, though. Maybe it will keep her and other nuts like her, if there are any, away!

We loved R. Henderson's reprint.

Floyd J. Peters

North Shore, California

[See Letters, September 1981]

A Salton Sea Resident Responds

I would like to respond to Joyce Trout [Letters, Aug., 1981], regarding the "smell" of the Salton Sea. It is unfortunate that Ms. Trout visited our area during one of our periodic die-offs. These occur once or twice a year due to Mother Nature.

During extreme hot weather, algae is released from the bottom of the sea which creates an oxygen shortage, and the fish trapped in this area die. If the wind blows, of course, they are pushed onto shore. Had Ms. Trout remained longer than two days, she would have seen that this condition just disappears—sometimes overnight.

The Salton Sea sustains a very large sports fishing industry as well as water sports, camping, etc. and provides winter refuge for many species of water

fowl. Ms. Trout's reaction is understandable, but I would urge her to visit the area again—she might find that she likes it as much as the hundreds of us who make this our home by choice.

Mrs. W.E. Pugh

Salton Sea, California

Disgruntled (rejected) Poet with a Sense of Humor

I hate thee—yes I do,
Let me count the ways:
I hate your nose, I hate your eyes,
I guess I hate your faze.

You're so ugly, so grotesque,
I cannot look at you.
If you'd smile, you'd kill a cow—
She'd drop without a moo!

Being obtuse, obnoxious, too,
Is your only style.
You're so mean, insufferable,
You'd eat a crocodile.

Just one little glance from you
Would stun a two-ton ox!
The only hope for all of us—
To nail you in a box.

But, otherwise, you're not so bad—
A really classy person.
Just please leave this hemisphere
And let us all stop cursin'.

Tom Teorey

San Bernardino County, California

Setting the Record Straight

Your initial editorial as *Desert* magazine editor suggests that you are no older than I was when I joined Randall Henderson as co-publisher of *Desert*, a pioneering venture which began in 1937. At the beginning I was 29 years old and Randall was 20 years older as he assumed editorship. I served as business manager for 21 months, leaving in 1939 for new areas of interest in Northern California.

I described our relationship in *Desert Editor* which I wrote and published in 1972.

I wrote the editorial statement of purpose which you reprinted in your August issue, with Randall's concurrence, which I used for subscription promotion. I also wrote a dozen or more articles for *Desert* magazine in the first two years, sometimes using the pseudonym Jonathan Bart (to avoid duplication). I also traveled through the Southwest selling advertising and newsstand distributorships.

Through the last 30 years (I am now 73 years old), Randall's name has appeared alone as author of the initial statement. I have never protested this apparent neglect, and I see little to be gained in claiming credit now. I thought you would like to be properly informed on this matter.

Please accept my congratulations on your new appointment. I hope you will have a long and successful career as editor.

J. Wilson McKenney

Diamond Springs, California

Thank you for your encouragement and support. If you have more to share with us about the desert and your life in it, I heartily welcome it.

**With sincere appreciation,
Stephen Simpson**

I'm Reminded of a Time

I received your sales pitch for *Desert* magazine and decided to be among the many who respond positively. I was a subscriber for years and I fail to recall why we didn't renew.

Back during the depression, Randall Henderson and I went out to the Cargo Muchacho Mountains and picked up "talc stone, etc." and I rocked up the front of his new publishing house in El Centro. Most of my remuneration came in the form of advertising. He ran a nice ad telling about my creative stone landscaping throughout Southern Califor-

nia. By the way, does anyone know what happened to the rockwork on the El Centro building—is it still there?

Rummaging through a scrap iron pile yesterday, I killed a big fat rattlesnake and got to thinking about my dozens of encounters with them. My thoughts turned to Randall Henderson and that trip to the Cargo Muchacho Mountains. Randall was knowledgeable about many, many things and he especially urged caution and safety around wild things. Our first choice slab of talc was leaning at a 45-degree angle when Randall discovered it. A rattler was coiled in its shade and almost got him. He failed to talk about the incident later.

About 1934, I was homesteading near Littlerock, California, and have some interesting experiences that could make a story: rattlesnakes under my bed, and an almost encounter with Bad Boy Ed Davis (not Pretty Boy Floyd). I also buried a valuable jewelry collection in the cellar of a lady who was once a dance hall gal in Nome and Fairbanks, Alaska. She called me son, since her only boy, an orchestra leader, failed to show after the Shanghai trouble with Japan. I earned my meals by cutting wood and washing dishes.

If you like rock work, we have 20 years worth of weekend and spare time effort here at Walden West. Garden and mineral clubs hold picnics here. Our place is an old Indian campground, and we have found 150 Indian rocks on our five acres.

Keep as close as you can to Randall's philosophy and try to hold some of the dune-buggies back in town.

*Kenneth Kriegh
25543 Walden
Romoland, California*

Rejected but not Dejected

Thanks for your thoughtful letter. Your analysis was accurate.

As for the little story itself, it was a result of the shock of finding my check-

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LETTERS

Continued

ing account at the bank embarrassingly low. I couldn't go back into gardening, because at age 74, my heart is a little tricky and the poor old body is infested with all sorts of minor ailments. I never go to doctors because I've never had any luck with them.

What to do to increase the checking account? In 1974 and 1975, in a burst of creativity, I wrote 84 manuscripts. All inferior, I would imagine, but 13 of them were published. Of these, I received checks for six of them, netting me a total of \$250.

So I laid out a plan to do one 1,500-word story or article a month. The one you read was the first. It certainly is contrived. Sewing together a number of real experiences into one alleged experience. And when you're

writing humor in the first person, you'd better be damn good to avoid sounding cute.

Most people, if they could write what they wanted to write, would write politically. You know: Make the world a fit place for every human being to be happy and purposeful. No hunger, no sadness.

Every time I infused a little politics into my writing, I got clobbered. You'd have to be an iron man to stand up to it. Give me perfect health, a fortress to live in, and a 30-man body guard, and I'll show you what guts are. Meanwhile, I'll just go on being my customarily cowardly self.

Thank you again for that fine letter.

Name withheld at Editor's request

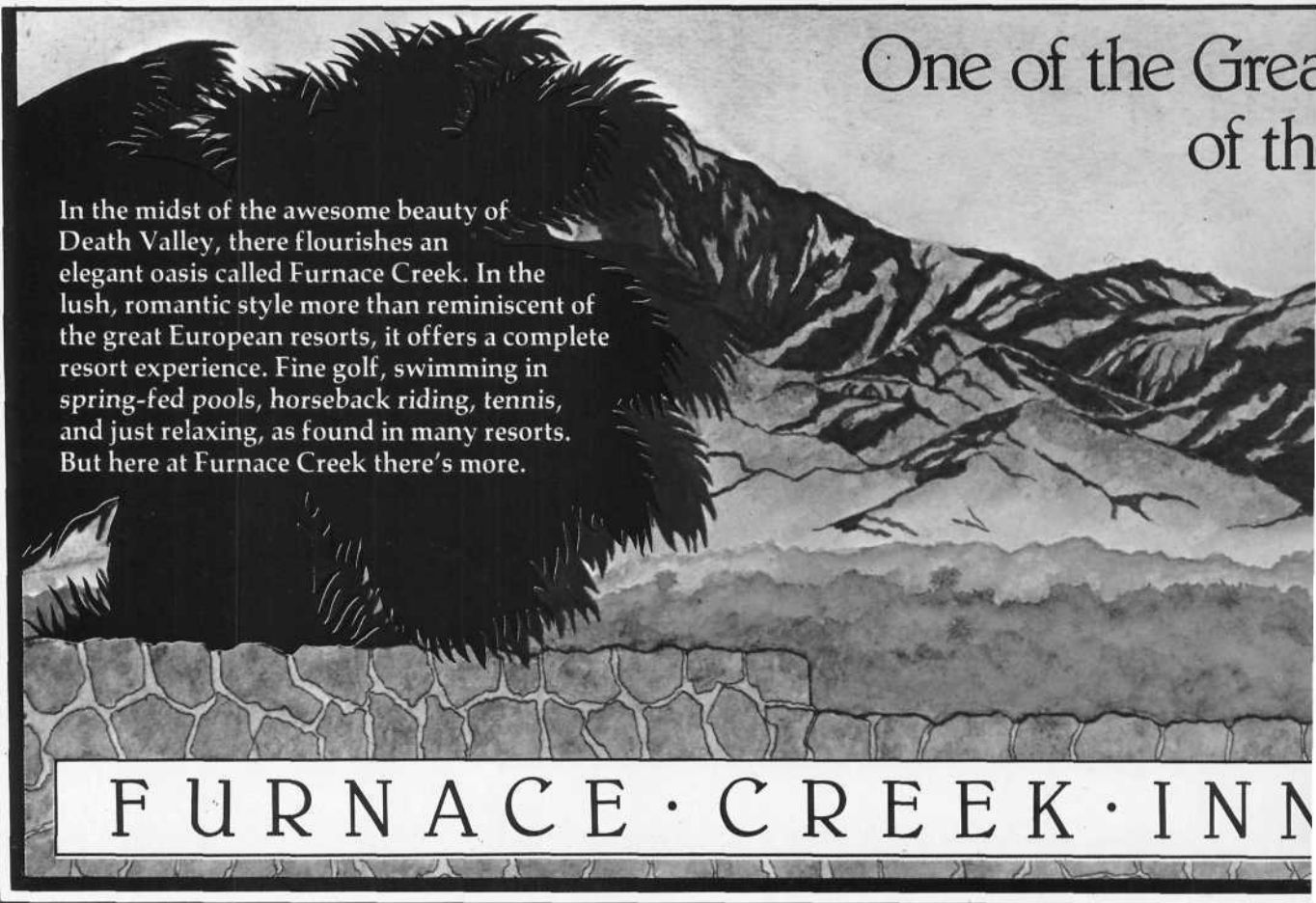
When or if you or anyone else is

willing to write/speak the truth of your experience for *Desert* magazine, I am willing to print it.

Two of a Kind

The July issue (page 31), had a story about a two-story outhouse. Belle Plain, Minnesota does not have the nation's *only* two-story outhouse. In June, 1973, we were touring the northern states and we visited Virginia City and Nevada City. These towns were restored. One of the buildings in Nevada City has a two-story outhouse. I have enclosed a slide for you to use. Thought you might like to know.

Bill Miles
Redlands, California



In the midst of the awesome beauty of Death Valley, there flourishes an elegant oasis called Furnace Creek. In the lush, romantic style more than reminiscent of the great European resorts, it offers a complete resort experience. Fine golf, swimming in spring-fed pools, horseback riding, tennis, and just relaxing, as found in many resorts. But here at Furnace Creek there's more.

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of the

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I Wish I Could

Thank you for sending me your mailer about subscribing to *Desert* magazine. I have my copies back to 1937, but I had to stop subscribing about five years ago. I am a senior citizen, over 75, and can no longer afford things, like we could when we worked. Of course, this applies to a number of things besides *Desert* magazine. On Social Security we don't receive enough to cover the cost of living, so this leaves us out. Thanks again. I felt I should answer.

*Ruth Davenport
Fontana, California*

Spreading the Word

We read *Desert* magazine.

We have a friend in Russia who has no idea about the Southwest life and what it has to offer. She only gets to know what the government wants her to know—yet she receives all our letters and packages.

I am sure she would be pleased to receive a free copy of *Desert* magazine from your office. If you are unable to send her one—yet know of a girl or boy, age 16-19, who would like to write to her, I am sure she would be pleased to hear from them. She is an 18-year-old girl. Her name and address are:

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(No city given)*

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THE LIVING DESERT

by Susan Durr Nix

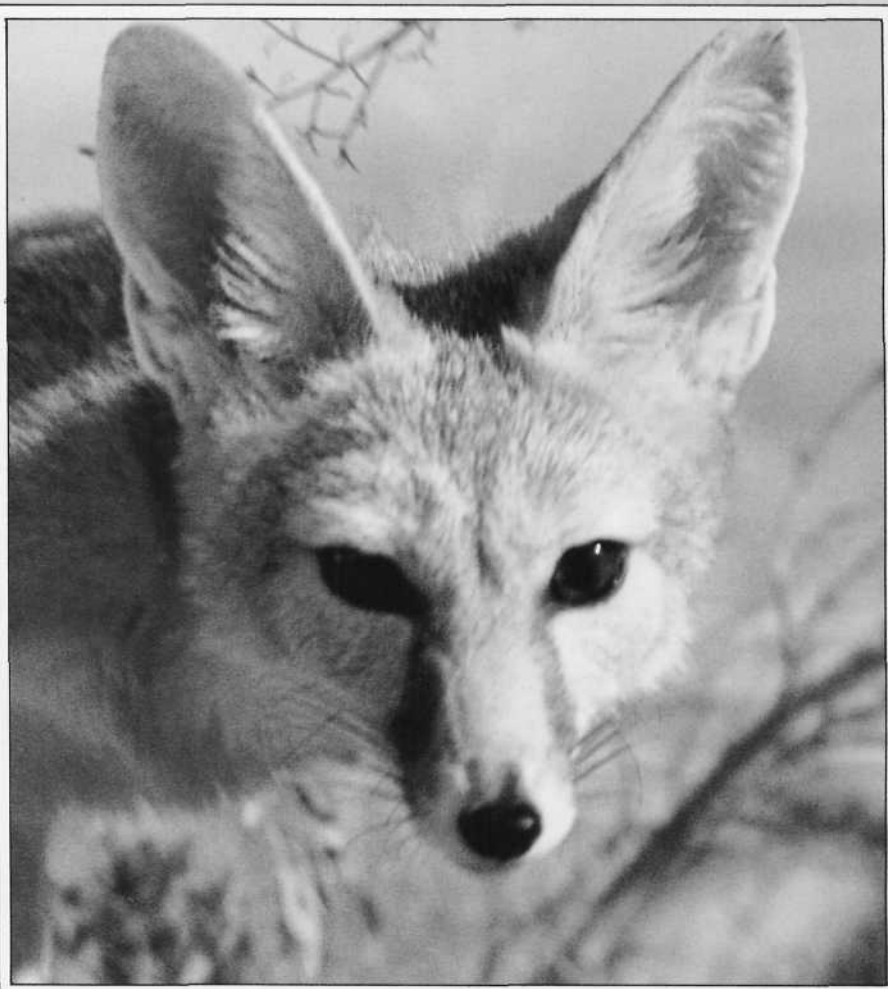
DUNESDAY

Join us in meeting the animals who inhabit the "barren" dunes.

In the dunes in August, the indications of life are bleak: dessicated creosote and yellowed tufts of grass, insect carcasses and purple shotgun shells. Derelict cement bags congregate with brittle tumbleweeds in the branches of a mesquite. Mummified golf balls loiter next to abandoned burrows, a parody of their counterparts on the links nearby. A lone cicada, three ants and a lizard are the only animals I can spot under the litter.

To be sure, an August noon is probably the worst time to visit the dunes. Midday casts no softening shadows on the chalky skull of a jackrabbit, nor on the vulgar scars of dirt bikes and dune buggies. Moreover, the sand is so hot it burns through the soles of your shoes and you cook, like a Thanksgiving turkey, basting in your own sweat. Only the holes that riddle the sand, the scat of coyotes, lizards and rabbits and the thoroughfares and intersections of animal traffic confirm the fact that the sand is home to an enormous variety of animals.

It's a peculiar and demanding home. A sand dune, whether fixed by deep-rooted plants or reshaped by every passing breeze, is a hot, arid, windy, open, gritty, crumbly, dangerous world. Survivors here must be suited to its exacting requirements. Walking on a dune is like slogging through a torrid snowdrift, so many dune animals "wear snowshoes" or have other adaptations for getting around comfortably and efficiently. Insects, rodents and hares race or hop over the ground on long strong legs. The sidewinder's unique looping locomotion not only keeps most of his body off the surface of the sand at all times, it gives him enough traction to move rapidly, even up a slippery incline.



Karen Sausman

Completely at home on the hot, sandy dunes is the kit fox.

Lizards, whose legs keep their bodies elevated, have a built-in advantage over their low-lying relatives. Many double the advantage by running from bush to bush on two legs, holding their tails high or flexing their toes for added height. Others climb vegetation to escape the burning sands.

Snowshoes are an extreme answer to the loose, hot sand problem. Among the mammals, kangaroo rats and kit foxes are so equipped: Thick tufts of hair on the soles of their feet provide traction and insulation. Roadrunners frequent the sandy haunts of favored reptile foods: glossy snakes, desert iguanas and

zebra-tailed lizards. These birds not only have very long toes, but sensibly designed feet, with two toes pointing forward and two backward in an X shape.

The fringes on the toes of fringe-toed lizards and on the legs of camel crickets are among the most exaggerated adaptations to dune life. Long, pointed scales on the lizard's hind toes increase the surface of the feet as do the combs of long hairs on the cricket's legs. Both of these animals "swim" through the sand with their fringes, as we swim through water with fins. The lizard has a bevy of adaptations to make this possible,

including smooth scales to reduce friction, a flattened body and devices for keeping sand out of eyes, ears, nose and mouth.

Most dune animals live in, as well as on, the sand. It's a rare creature who can long survive in plain sight of hungry predators and a rarer one still who can long endure the extreme temperature of the upper sand which often reaches 180 degrees Fahrenheit. Retreating into the sand during the day provides animals that can't fly or climb with a measure of security and comfort.

Comfort? Although nothing seems as dry as a dune, inches beneath the surface is a humid zone that may be 100 degrees cooler than the surface. Porous sand absorbs almost all the water it receives. The water sinks in for a distance directly proportionate to the intensity of the rainfall. Although a 1/4-inch shower moistens the sand only to a depth of about two inches and quickly evaporates, an inch and a half will sink a foot. At this depth, the moisture may last for decades, sustaining both animals and plants. Well-insulated against heat and cold by layers of dry sand above and below, this humid zone is the ideal site for a desert community.

This is the zone of hibernation and its summer equivalent, estivation. It is the location of kangaroo rat, pocket mouse, shovel-nosed snake, ant, beetle, millipede, scorpion, lizard and numerous other animal burrows. When enough cover is available, cottontail and kit fox dens may also be present. Outside, non-burrowing animals, like jackrabbits and sidewinders, dig down to this moist layer and wait out the heat of the day in these shaded hollows.

There are many animals who escape unfavorable conditions as eggs, larvae, pupae or dormant adults inside the dunes. Other live in microniches—like the thrip in the grooves of the tiny pleated leaves of the dune *coldenia plicata*—or spend most or all of their lives under the sand, foraging on

entombed seeds and detritus. Most animals, however, venture out between dusk and dawn, exhibiting a complex web of relationships with vegetation, terrain and one another.

Some of these links are neutral. In the Coachella Valley dunes, for example, up to six species of seed-eating rats and mice co-exist without competition. Each forages for a particular size and type of seed without infringing on the food preferences of others. Other links, such as the cellulose-digesting parasites and their desert termite hosts, are beneficial. By far the most dramatic are the antagonistic relationships—the squabbles for territory and mates and the interactions between predator and prey.

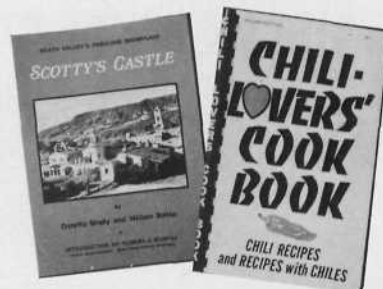
Even here, the community interrelates in an orderly manner. Hunters are kept in check because the hunted are adapted to detect and escape them. Coloration, hearing, eyesight, smell, muscles, weapons, shape, size, habits, birthrate and a host of other refinements operate with the environment to keep prey populations intact, as well as to help predators exploit them.

The dune community is a fragile and delicately balanced one, made up of animals and plants with unbelievable specializations that suit them for no other habitat. It's hard to believe that mere mounds of sand could be so full of life, or that the cadence of nature continues on even the hottest August day. **2**

Susan Durr Nix is Development Coordinator at the Living Desert Reserve, a 1,000-acre desert interpretation and conservation facility in Palm Desert, California. She shares her enthusiasm for the natural world not only in articles and publications, but in educational programs for visitors to the reserve.



for visitors to the reserve.



20-MULE TEAM DAYS IN DEATH VALLEY by Harold O. Weight. Specialists and critics praise this account of the great borax wagons of the 1880s, the drivers and mules, the trail to Mojave. Story of Borax Smith, Wm. T. Coleman, Death Valley pioneers, Harmony Borax Works. First-hand stories. Includes reprint of Henry G. Hawks' report on Death Valley 1883. Pb., 48 pgs., 33 historic and modern photos, map. 5th ed. \$1.00.

CHILI LOVERS' COOKBOOK compiled by Al and Mildred Fischer. Two cookbooks in one. The first portion describes the best of chili cookery, from mild to fiery, with recipes for some of the best. The second part gives a variety of taste-tempting foods made from chili peppers with many suggestions on use and preparation. Spiral bound. Pb., 128 pgs. \$3.00.

SCOTTY'S CASTLE by Dorothy Shally and William Bolton. The sumptuousness of the castle, its history, construction, and design of the buildings are told by the authors, both National Park Service employees who have been associated with the maintenance and interpretation of the property since the government acquired title in 1970. Pb., large format, profusely illus., \$2.00.

ANZA-BORREGO DESERT GUIDE BOOK, Southern California's Last Frontier by Horace Parker, revised by George and Jean Leetch. A classic reference to America's largest desert park, originally published in 1957 and now updated, enlarged and improved by the "dean of desert rangers" and his wife. With excellent logs, maps, and photographs brought up to 1979 standards. Pb., 154 pgs., two maps, many photos, \$6.95.

HIGH MOUNTAINS AND DEEP VALLEYS by Lew and Ginny Clark, with photographs by Edwin C. Rockwell. A history and general guide book to the vast lands east of the High Sierra, south of the Comstock Lode, north of the Mojave Desert, and west of Death Valley, by oldtimers who know the area. Pb., 192 pgs., 250 photographs, and many maps. \$6.95.

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CHUCK WAGON COOKIN'

by Stella Hughes

Cattlemen's Barbecue

A friend once said of me, "The trouble with Stella's recipes is that they all start with: *first butcher a beef!*"

I deny that, however, it's not a bad idea if you're planning an outdoor feast for several hundred people.

Each summer for the past 25 years my husband, Mack and I have helped "put on" the barbecue for the Greenlee County Cattle Growers annual meeting in late August. Three hundred members and their guests attend. Preparing meat for that many requires community effort. Where we live on Eagle Creek (over 40 miles from the nearest town), there are a group of closely-knit ranchers who believe in the good-neighbor policy, and all pitch in and help.

We barbecue deep-pit style, so you don't need a lot of expensive equipment or unnecessary gadgets. Nor do you need to spend a lot of money on constructing elaborate outdoor grills or ovens. All you need is space, a shovel and the man-power to dig the pit. The one we use was dug years ago, in good hard clay. The pit is four feet deep, four feet wide and eight feet long, and has neither rocks or cement on the bottom. Nothing could be more simple or less costly.

The coals and ashes from the previous barbecue are allowed to remain in the pit until just prior to using again. If it has been an unusually wet summer, it may be cleaned out a few days earlier and allowed to dry.

Usually it takes about a cord of good dry oak, cut in four to six-foot lengths, with none larger than a man's thigh. The afternoon before, Mack starts the fire in the pit and feeds it continuously for six to seven hours, or until there is a



Stella Hughes



Stella Hughes

Above left: Two neighbors assist in uncovering the beef pit. Above right: Mack Hughes lifts the bundles of barbecued beef from the pit after 18 hours.

bed of red-hot coals at least two feet deep. During this time, ranchers gather to swap lies, discuss the rainfall or cuss the lack of it, swig cold beer kept in ice coolers or drink scalding coffee from tin cups. It's a good time to catch up on visiting. Soon fall roundups will start and no one will have time to while away a lazy afternoon just gossiping.

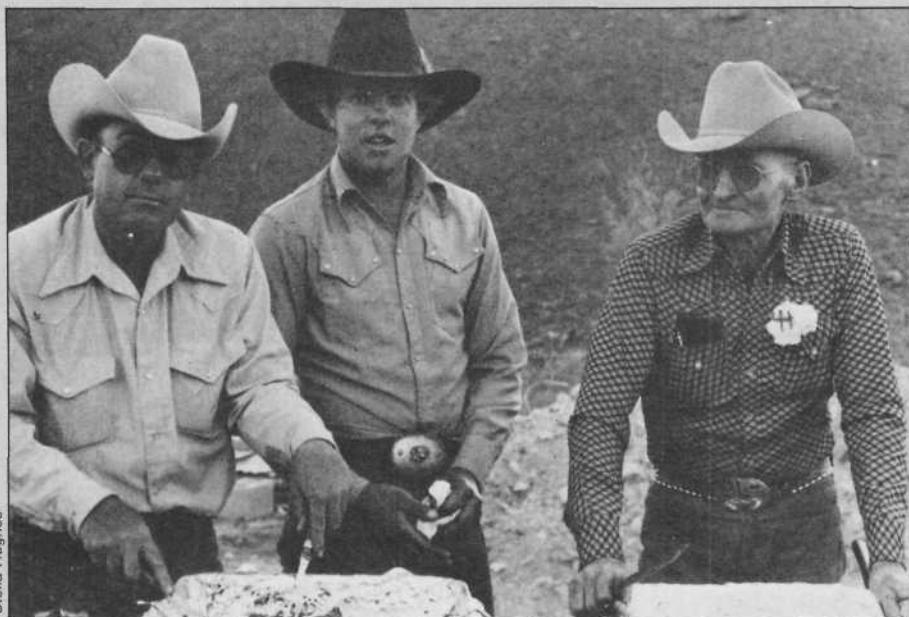
We barbecue deep-pit style, so you don't need a lot of expensive equipment or unnecessary gadgets.

While the fire is dying down to glowing coals, the ranch women have been preparing the meat, seasoning the roasts with sliced onions, slivers of

garlic, salt, pepper and dashes of liquid smoke. For years the cattlemen butchered their own beef, and roasts were cut from both front and hind quarters, and the ribs were used. In the last few years meat has been purchased in rolled, boneless roasts, wrapped in netting. Much time and labor is saved this way and the meat is delicious.

After seasoning the meat, each roast, weighing about 20 pounds, is wrapped in extra heavy foil. Then the bundles of foil-wrapped meat are put into wet burlap sacks, folded over and tied securely with baling wire.

When the coals are just right and all bundles of meat ready, sheets of corrugated iron are laid directly on the hot coals, slightly overlapping. We put the bundles of meat in quickly, arranging them either a few inches apart or barely touching. We never pile them on top of each other. Two more sheets of corrugated iron are placed directly on top of the bundles of meat, making sure all are covered. Shovelers begin throwing in the dirt. Several men



Twister Heller, Mike Hughes and Mack Hughes, ready to serve hot barbecued beef.

wielding shovels can cover the meat in a few moments. We make sure no air pockets remain, and check again later. If a wisp of smoke is escaping from a corner, we add and tamp down more dirt.

Now that the burying is over we can celebrate, unless it looks like rain; then we can worry. One good precaution is to have trenches dug around the covered pit and plastic sheets spread all over. A few prayers wouldn't hurt. It would be a catastrophe should the pit fill with water while the meat is cooking. Locating the pit in a well-drained area in the first place is a must.

The resurrection of the meat does not occur until noon the next day just before serving time.

Eagle Creek has giant sycamores lining its banks, and the cattlemen's barbecue is held in a secluded spot surrounded by these lovely white-barked shade trees. Long tables made of 2' x 12' planks placed on 50 gallon barrels are used for serving. Members of the cattlemen's group bring salads of every description: green tossed, bowls of luscious jello and fruit concoctions and

potato and macaroni salads, lavish with slices of boiled eggs and ripe olives. Those women who pride themselves in making desserts, bring their prize-winning apple pies, chocolate cakes dripping with coconut icing, rich puddings weighed down with crushed nuts and marashino cherries and even iced melon salads that are a chore to keep fresh and cold. No matter, once the meat is sliced, the long line of hungry people soon make the lovely array of dainty dishes look as though a Texas tornado has struck.

After the meal, members hold their business meeting while the kids run amok, locusts whirl away, and at times make such a racket that they drown out the cries of the kids.

William Allen White wrote about the ideal barbecue: "At best it is a fat steer, and it must be eaten within an hour of when it is cooked. For if ever the sun rises upon Barbecue, its flavor vanishes like Cinderella's silks, and it becomes cold baked beef...staler in the chill dawn than illicit love."

Mister White is full of hooley! We freeze left over barbecue in foil for

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Cookin' Continued

months at a time, and it makes about the best left-over meat dishes you ever flipped a lip over!

Left-over barbecue, flaked or shredded, can be used in a dozen different ways. The one I like best uses fluffy rice, dotted with butter, lining a baking dish. Filled to the edge of the rice is hot left-over barbecue, made rich with packaged or canned beef gravy. You can also use beef stock and add hot tomato sauce or picante sauce according to taste.

Shredded left-over barbecued beef is great for making tacos or even used in making tamales. Beef-pot pies or shepherd's pie, using several kinds of vegetables and flaked barbecue, are wonderful fare on a cold winter's night.

Barbecued beef, run through the meat grinder and added to a Dutch oven of fried potatoes and onions, sticks to the ribs, and is another good way to use left-overs.

Bean 'n Beef Pie

- 3 cups shredded left-over barbecue beef
1 can (3½ ounces) French fried onions
½ cup dry bread crumbs
1 can (10 ¾ ounces) condensed cream of mushroom soup
1 egg
¼ teaspoon thyme leaves
¼ teaspoon salt and dash pepper
1 can (16 ounces) French-style green beans, drained

Heat oven to 350 degrees. Mix meat, half the onions, the bread crumbs, ¼ cup of the soup, the egg, thyme leaves, salt and pepper. Press mixture evenly against the bottom and side of an ungreased nine-inch pie pan. Turn beans into the meat-lined pan; spread remaining soup over the beans. Bake uncovered for 35 minutes. Arrange the remaining onions on top; bake 10 minutes. Serves 4. **D**

Stella Hughes has written articles for many western magazines, and is a regular contributor to Desert magazine. She lives 46 miles from Clifton, Arizona near Eagle



Creek. She learned how to camp-cook many years ago, out of self-defense, and many of her experiences have been related in her book, Chuck Wagon Cookin'.

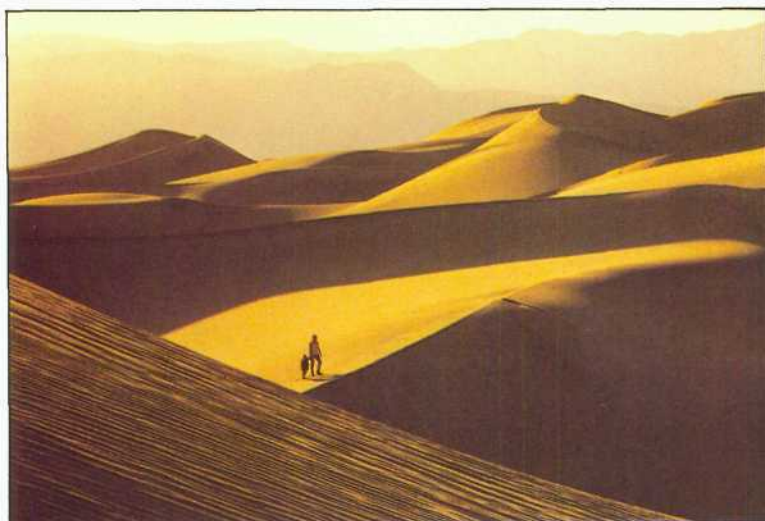


TRACES IN THE SAND

And each such moment holds more magic and miracle and mystery than we—so long as we are less than gods—shall ever be able to understand. *Edward Abbey*

excerpted from *Abbey's Road*, by Edward Abbey, Edward Abbey, 1979. Photo by David Muench

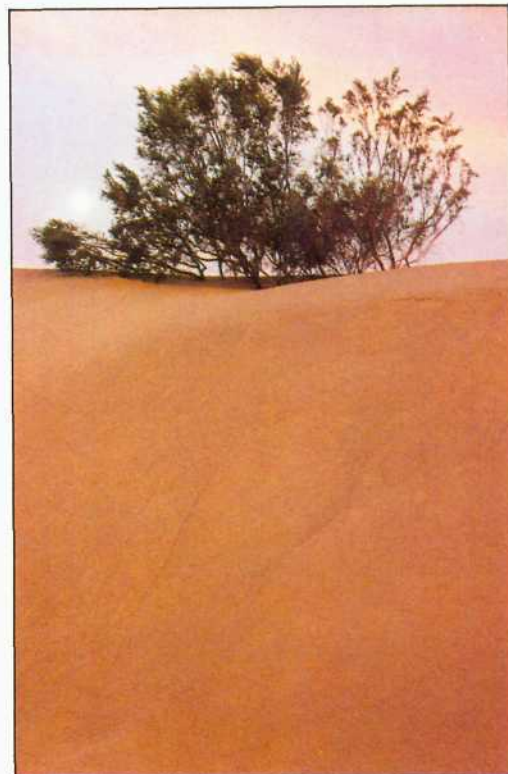
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A. Light and shade contrast in the Mesquite flat dunes of Death Valley National Monument in California.—David Muench



B. An ocotillo blooms with the Kofa Mountains of Arizona in the background. David Muench



C. A creosote bush witnesses the dawn, with the moon setting, over the dunes at Death Valley National Monument in California—Jeff Gnass

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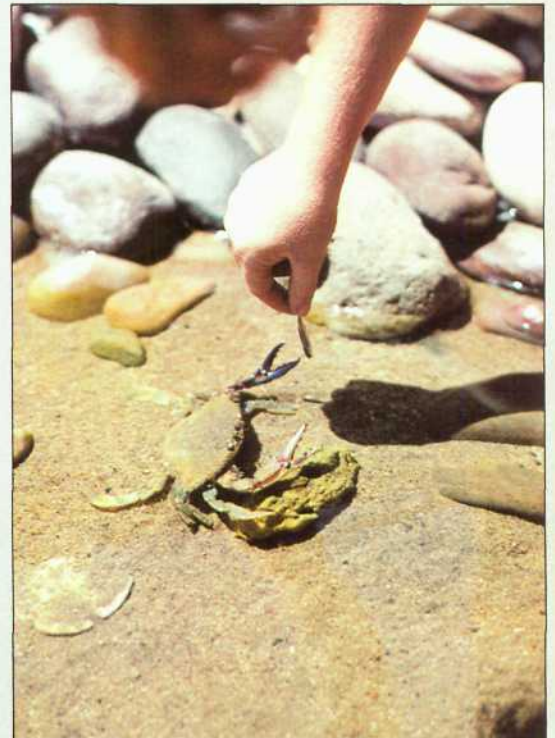
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Big Surf isn't the only
"ocean" in Tempe,
Arizona; there's another
one right in the middle of
my backyard. It's
brimming with sea life, a
true microcosm of a marine
intertidal community.



A backyard, intertidal community in Tempe, Arizona

A DESERT MARINE OASIS

Text and photography by
Dr. Sherwood B. Idso

The first rays of the morning sun are trying gamely to wrest dominion from the darkness of night as I make my way to the rock-strewn shoreline. The wind is still and the water calm. Suddenly, however, the surface boils with activity; and a school of grunion zigzags frantically to escape the menacing jaws of a threespot flounder. Their madcap maneuvers act as an invitation to still other assailants, drawing barred serranos out from coral crevices to strike at stragglers. Even a southern midshipman joins the melee. Opulent photophores glisten in the subdued light of dawn, like the rhinestone sequins of a Las Vegas showgirl.

Then, as suddenly as it began, the commotion stops; and the surface again assumes a mirror-like quality. Just below that pretense of peace, however, battles of another nature are being waged. Killer snails are boring holes into the armor plating of clams and oysters, and they in turn are being preyed upon by voracious blue crabs. Still other crabs are eating them to ultimately provide food for the octopus that lurks nearby in an underwater cave. Armies of small hermit crabs scour the rocky substrate for scraps from the spoils of

battle, and colorful sea anemones spread forth their delicate but dangerous tentacles to claim their share of the action. Now, however, they are beginning to retract, in deference to the increasing intensity of the morning sun. I wipe my brow and retreat to my home for a light breakfast and a few more minutes of sleep.

Yes, it's great to live on the seashore and be able to observe daily the fascinating activities that occur there. Unfortunately, not all of us are able to do so—including me.

But you said...

I know. It's all true. You see, Big Surf isn't the only "ocean" in Tempe, Arizona; there's another one right in the middle of my backyard. It's brimming with sea life, a true microcosm of a marine intertidal community.

Let me start at the beginning.

Last November I learned through some science news journals that marine biologists at the Smithsonian Museum of Natural History in Washington, D.C., had established a living coral reef community in a 3,000-gallon tank now on display to the public in their Sea Life Hall. This was no small accomplishment. Such a salt water community had never before been successfully maintained in complete isolation from the sea. In fact, only three other places in the world could lay claim to having similar marine displays; and these three institutions are all located on sea coasts, allowing them to continually circulate ocean water through their tanks. The Smithsonian's is the only truly "closed" system to ever survive for any length of time.

When my family and I read the news reports of their success, it spurred us to contemplate such a project of our own.

We had kept salt water aquariums for several years, and even brought back a few sea creatures from the Gulf of California near Puerto Peñasco, Mexico, where we sometimes vacationed. Thus, I dashed off a letter to the Smithsonian Institution asking them for advice on how to begin.

Two weeks later when they had not replied, I sent them a second letter. But again the results were the same; we were ignored. Blissfully unaware of the problems that could occur, we started out untutored, but also undaunted.

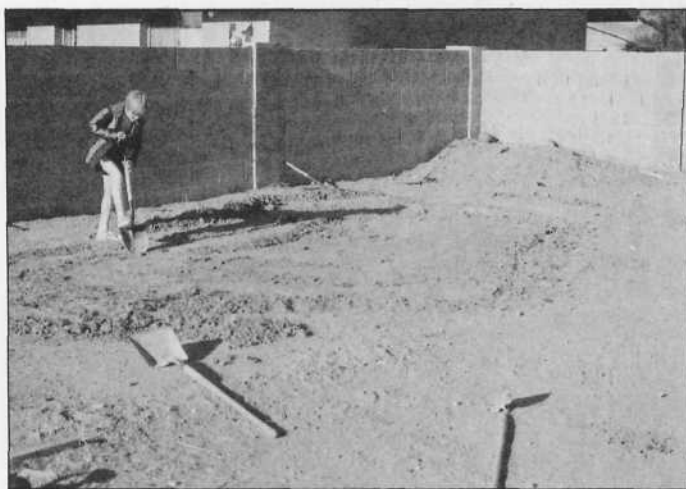
Since we lived in a desert climate where the winters are very mild, we decided to construct an outside pond, rather than build a large tank indoors. Consequently, our first order of business was to dig a basin for it; and all six of our children helped, from 14-year-old Grant, who wielded the pick ax, right down to two-year-old Julene, who scraped the hard clay we encountered with her sandbox shovel. Several of the neighborhood kids pitched in; and before Christmas the excavation was complete.

Next came one of the more unique aspects of our project. In order to give us a better insight into the behavior of the creatures which would eventually live in the pond, we built a small underground chamber through which we could view the interior of our watery world via a three by four-foot pane of plate glass. To provide another viewing perspective, we also constructed a 20-foot arching bridge to span the two-lobed basin at its mid-point.

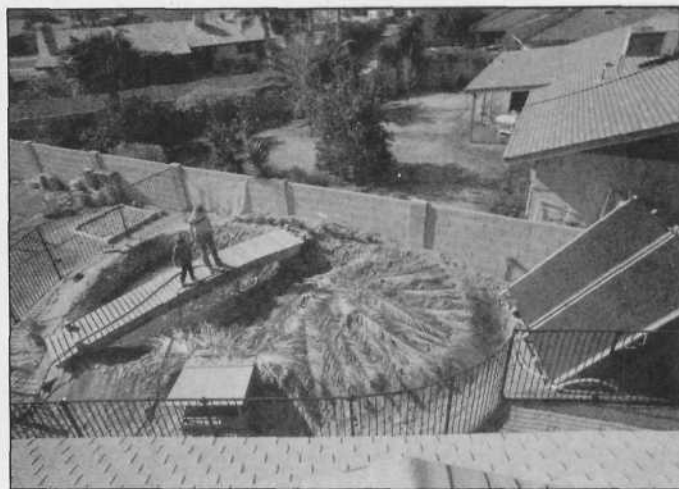
With these preparations complete, we purchased several large rolls of 40-foot wide, black polyethylene to lay over the basin and provide an impervious barrier to keep the water from seeping out. The

Above left: Sea anemones and gorgonian corals highlight the tidal pool in the shallow end of the pond.

Below left: Lance feeds one of our hungry crabs a fresh-water minnow.



In late November, Keith starts digging the basin for the pond in our backyard.



Palm leaves are added, and two solar panels are installed for heating and cooling purposes.

five layers that we put in were weighted down with thousands of pounds of smooth round rocks that we collected from the dry bed of the Salt River near the original location of Hayden's Ferry. We had a local gravel company dump 14 tons of fine sand on our driveway, which we wheelbarrowed out back to cover the bottom of the pond, its outer sides and a small island in the center of one end.

Knowing that we would need some type of water circulation system, we had an electrician provide power outlets to the pond, as well as to the underground viewing chamber, from which we control two underwater search lights. A friend of ours, in the swimming pool business, helped us install a standard swimming pool pump and sand filter. About that time I became concerned about temperature control, and I read that the Steinhart Aquarium in San Francisco had just installed the first solar panels ever to be used to heat a salt water tank. I purchased two 4 by 10-foot passive black plastic panels and installed them facing the south at a 45-degree

volume of water added. Several hours later, when the basin was finally filled, I calculated that we had put in 4,000 gallons, making our system a full 30 percent larger than that of the Smithsonian's. In the process of filling, a few leaks did develop inside the observation chamber; but after a few hours they subsided, apparently due to the swelling of the wood upon wetting. There have been no leaks since.

**We are all a part of the
grand design of nature,
where the concept of
community plays a most
essential role.**

Wary of converting immediately from fresh to salt water, I did not add the synthetic sea salts that I had ordered from Cleveland, Ohio at once. Instead, I first took a trip to Scripps Institution of Oceanography in La Jolla, California. I had to go there to present a talk at a scientific meeting on world climate; and in an attempt to make the most of the opportunity, I took two of my sons with me. We visited with several of the marine biologists stationed there, trying to glean from them every bit of helpful information that we could. When all was said and done, however, their best advice to us was to let the pond remain a fresh water system. They said that even their own tidal pool display with its continuous circulation of water from the ocean was a tricky operation. A closed system in the desert of Arizona was doomed to failure.

Well, that settled our minds once and

for all; and as soon as we got home we dumped in the salt!

Changes began to occur almost at once. The large population of aquatic insects that had begun to proliferate in the pond vanished, as did the algal growth that was beginning to develop. Fifty black mollies that we had purchased from a tropical fish store survived, however, being equally at home in either fresh or salt water. But for a long time, they remained the only life form in the pond of which we were aware.

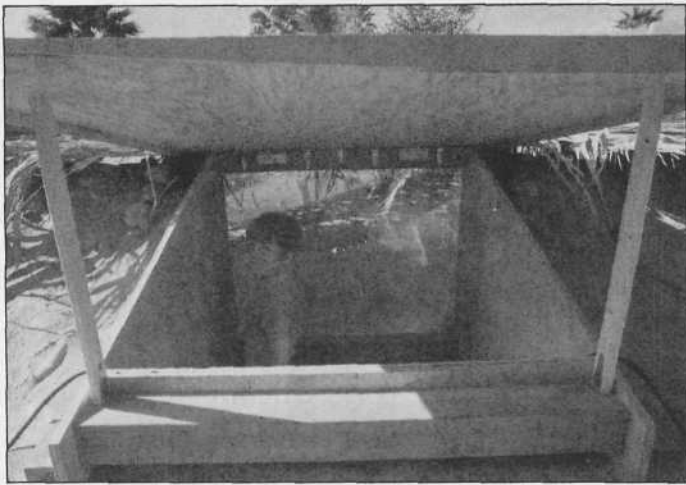
All this changed after our first collecting trip to Puerto Peñasco. After three trips, we found ourselves housing a veritable aquatic zoo. I have already mentioned our grunion, flounders, barred serranos, southern midshipman, and octopus. In addition, we have schools of sergeant majors, gulf opaleyes and Pacific flagfin mojarras; as well as numbers of gobies, blennies and bullseye puffers. Crabs and shellfish of all types inhabit the tidal pool portion of the pond; along with shrimp, barnacles, sea cucumbers, sea squirts, bristle worms, feather dusters and other unidentified hitchhikers that have come along with algae-covered rocks and corals. Presently, we estimate that we have about 50 different species living in the pond. Our goal is to someday match the two to three hundred species claimed for the Smithsonian system.

A community in itself, our "marine oasis" is also a focal point for community activities in our immediate neighborhood. School groups regularly come to visit it; and we have put together a slide presentation describing all phases of its development and highlighting some of the creatures that inhabit it. We have also developed *Dr. Idso's Amazing Traveling Marine Aquarium Show*, consisting of a gigantic glass goblet within

The experts said it couldn't be done. That was the best piece of encouragement we could have ever received.

angle from the horizontal in such a manner that they also provided shelter for the pump and sand filter.

Finally, the moment of truth arrived; we were ready to add water to the basin and see if it was leak-proof. Turning our hose into the pond, I periodically checked our water meter to keep track of the



Lance checks the water level in the observation room as water is added.



Keith and a friend work a 20-foot net to capture a school of grunion near Puerto Peñasco, Mexico.

which we have established a miniature marine ecosystem composed of more than two dozen different salt water species. It goes with us to such places as Cub Scout Pack Meetings and stays for extended periods at elementary schools with accelerated science programs. For children in Junior High School, our pond serves as a resource for science fair projects. The older Boy Scouts use it as a field site for conducting studies required for the Environmental Science and Oceanography Merit Badges.

I am conducting studies of a basic scientific nature with the pond. Since I was trained as a physicist, the first aspect I have chosen to investigate is that of its thermal characteristics. Every morning, just after sunrise, when it is coolest; and again every afternoon when I come home from work, when temperatures are the warmest, I measure a variety of water surface and bottom temperatures. I also measure air temperature, humidity, the temperature of the solar panels and the temperature of some adjacent dry sand. Down in the observation chamber, I am able to measure the water level accurately and calculate the amount of evaporation for each 24-hour period. This allows me to do a complete energy balance analysis of the system.

Unlike flow-through systems connected to the ocean, which vary in temperature by only tenths of a degree each day, temperatures in the pond go through a diurnal cycle of 10 to 15 degrees. In the summer it gets very, very hot. Even at water temperatures approaching 100 degrees Fahrenheit, I have observed no signs of stress in any of the pond's inhabitants. Perhaps we are breaking some new ground here that may have wide-ranging ramifications.


I guess the most exciting aspect of the whole project, however, is the frame-

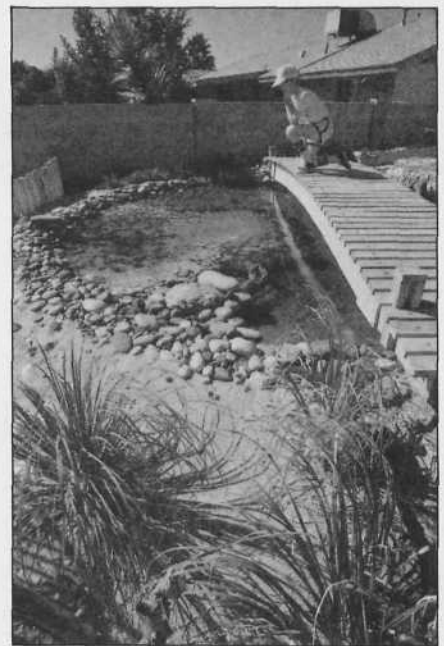
work for adventure and cooperation it provides for our family. As our involvement with it has grown, we have formed our own research corporation to serve as an umbrella for our activities. Christened the Institute for Biospheric Research, Inc., it has four separate divisions; each of our four sons is the Associate Director of the division in which he is most interested. The work of the pond comes

I guess the most exciting aspect of the whole project, however, is the framework for adventure and cooperation it provides for our family.

under our Marine Biology Division headed by 12-year-old Keith. Although he hasn't brought in any large government grants to ease the financial burden of operating expenses, he has produced some good stories for children's magazines and is gaining knowledge and skills that could lead him to a career in some phase of oceanography.

We see in our marine oasis a most interesting phenomenon. It is a well-defined community in its own right, nested within the larger community of our family corporation, which exists within the community of our neighborhood, and reaches out to the scientific community of the world. We are all a part of the grand design of nature, where the concept of community plays a most essential role.

Well, time for supper. Keith, go catch us a couple flounders. And watch out for sharks!! 



A little landscaping adds the final touch.

Sherwood B. Idso is a research physicist with the USDA's Agricultural Research Service at the United States Water Conservation Laboratory in Phoenix, Arizona.



He also holds adjunct professorships in the Departments of Geology and Geography at Arizona State University and is founder and President of the Institute for Biospheric Research, Inc. of Tempe, Arizona. He has conducted basic research in a wide variety of environmental areas and has published over 200 articles in professional science journals. Dr. Idso was honored in 1977 to receive the United States' Arthur S. Flemming Award as one of five outstanding scientists under age 40 in the Federal Service.

Text by Virginia A. Greene
Photography by Alan Benoit (except where otherwise credited)

SEDONA

Grace in the red rocks

Sedona. There's something about it... Grace. There's an air of grace, I guess you'd call it, that exists beyond all the perfect scenery, the ideal weather, the warm, neighborly, Western hospitality.

Sedona. I guess it's one of my two favorite places in the world. "How do you feel about Sedona?" an editor once asked. "I love it." "Then show me. Tell me." And what do you say?

It was a well-worn path, dark, soft, leaf-mould earth, strewn with broken pieces of sandstone. The trail rounded the shoulder of the canyon and dropped steeply into the stream bed. In the shallows the water ran smoothly, glinting in the first morning sun. Small rounded stones on the bottom were rust brown with sun moss. In the sand along the edges of the creek the wild mint grew. In the water itself the cress, old and tough, had gone to heavy seed.

Two small girls, pigtailed and brown-legged, played in the shadows. They were as quiet as my memory, stretched across 30-odd years. My sister and I had claimed this place long ago, in the privacy of make-believe. Great sycamores drifted an occasional leaf to become a flotilla of miniature craft on the water below.

It hadn't changed. In all the years between childhood's play and this warm December morning of adulthood, Oak Creek has shone brightly. It has remain-

ed a long sword of silver through the canyon, emerging at last to fumble and giggle its way through the eastern edge of town.

I poked a stick into the sand and watched the hole fill slowly with water. A red-tailed hawk caught a thermal draft and circled high above.

The heart said, "Don't go." Reality said, "It's an hour's hike back to the coffee shop and you have a rendezvous with a cowboy."

*This was the Sedona
landscape in all its subtle,
explosive magnificence.*

The long, crooked stick steadied my course downstream and pointed the way back to Sedona, that little Arizona village that is known as The Lady of the Red Rocks.

I whacked my stick against a rock, stopped to watch a soggy, wizened-up apple bob past a tiny rill, and thought about the ways a person can teach reluctant children about poetry, or how to describe without pretention the silent thunder of a summer's dawn, or how to show how one little village can differ from a hundred others its size.

There in Arizona's famous Red Rock Country, at the southern end of Oak Creek Canyon, Sedona draws the imagi-

nation to a way of life which has all but been forgotten. She welcomes them all—all the artists and writers, movie-makers and industrialists, retirees and schoolteachers, cowboys and tourists who find their way to her door. Whether they're among the 9,000 permanent residents or the two million visitors passing through each year, they speak with love and respect of the little town.

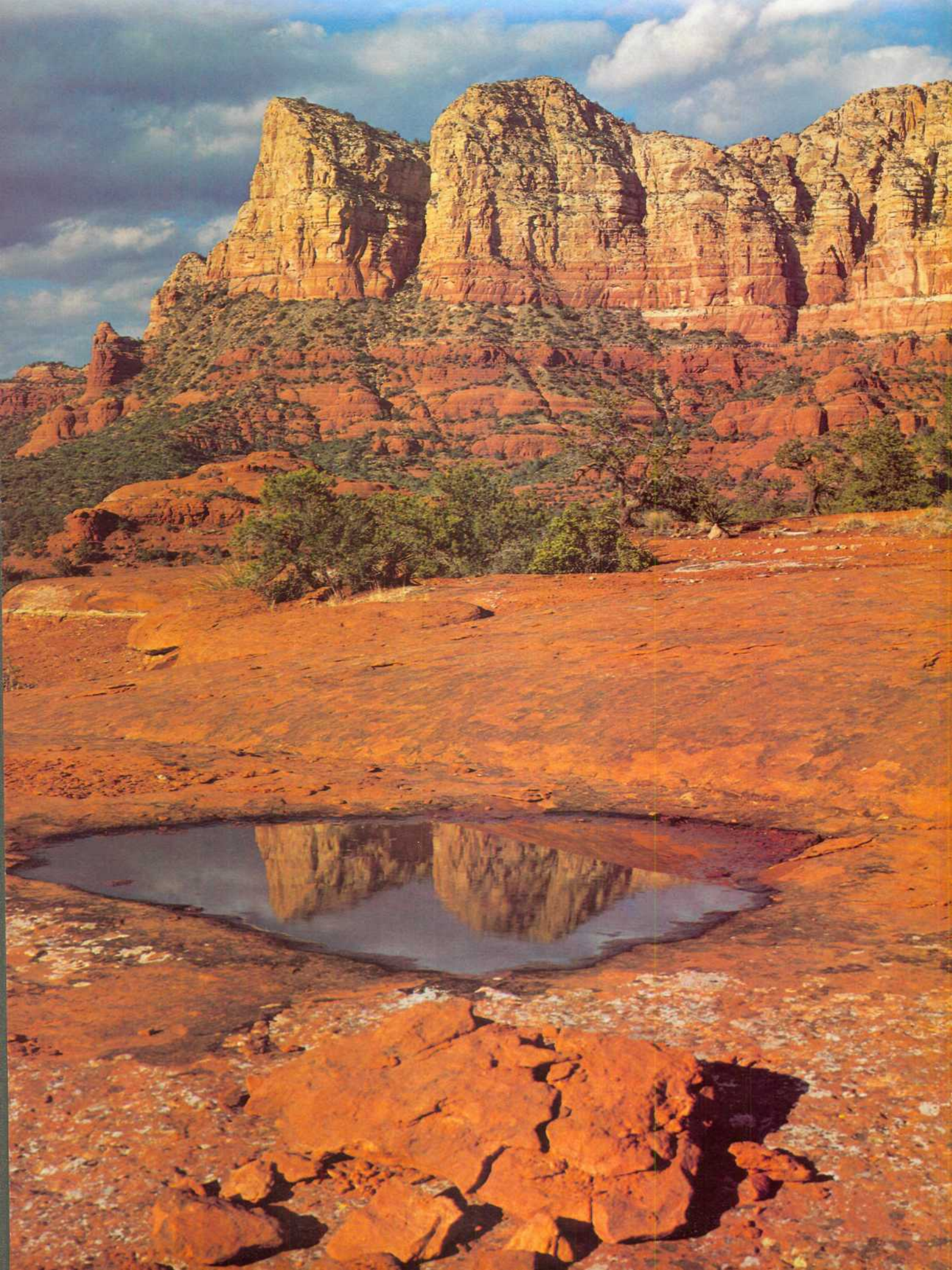
It's obvious, too, what brings them there. Take Richard Riley, for instance.

"We drove through on our way to the Grand Canyon four years ago and stopped for about 15 minutes. Went on to the Canyon, then went home to Michigan, sold our house and came back to stay."

What brought him back, specifically? "All *this*."

His nod included the vastness of the scene spread below the jeep he drives as part of John and Mary Ann Minnick's Pink Jeep Tour force. *This* was the massive red sandstone buttes rising flat-topped and abruptly out of the red earth among the Arizona cypress, the cedars and ponderosas and manzanita. *This* was the autumn sun shining with a pale glare off the creek that winds its way beneath golden cottonwoods. *This* was the mountain range and rim country stiffly rising immediately to the north. *This* was the Sedona landscape in all its subtle, explosive magnificence.

Scenic Oak Creek Canyon.





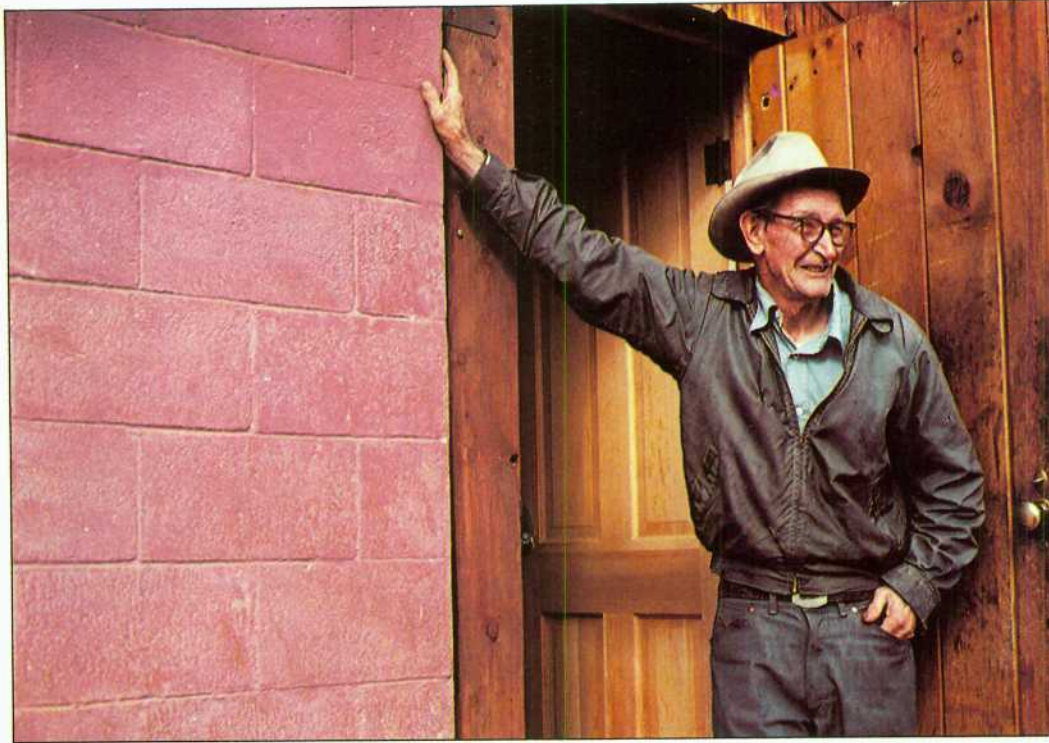
If you hold out your hand, cup it deeply, and then tilt it so it slants toward you, it will resemble nothing so much as a great, wrinkled canyon. Where the fingers join the palm, Sedona nestles quietly into the lower end of Oak Creek Canyon, slashed into the southern margin of the Colorado Plateau and merged into the northern reaches of the Verde River Valley. It has a pleasant country highway that makes a great tour of the valley, then circles up and around the long meadows on the lower slopes of Mingus Mountain. It climbs sharply over a ridge and is gone into the tree-studded slopes of the country beyond, leaving the little, almost-hidden place to its own devices.

Fifteen years ago, Sedona was a small, unincorporated place with a population of 1,200, retaining much the same pace and atmosphere as when it was founded in 1902. The days and the seasons moved along with an unhurried gait. In the past decade, the little town has grown in much the same way: It has retained the slow pace and the understated, quiet, Western atmosphere.

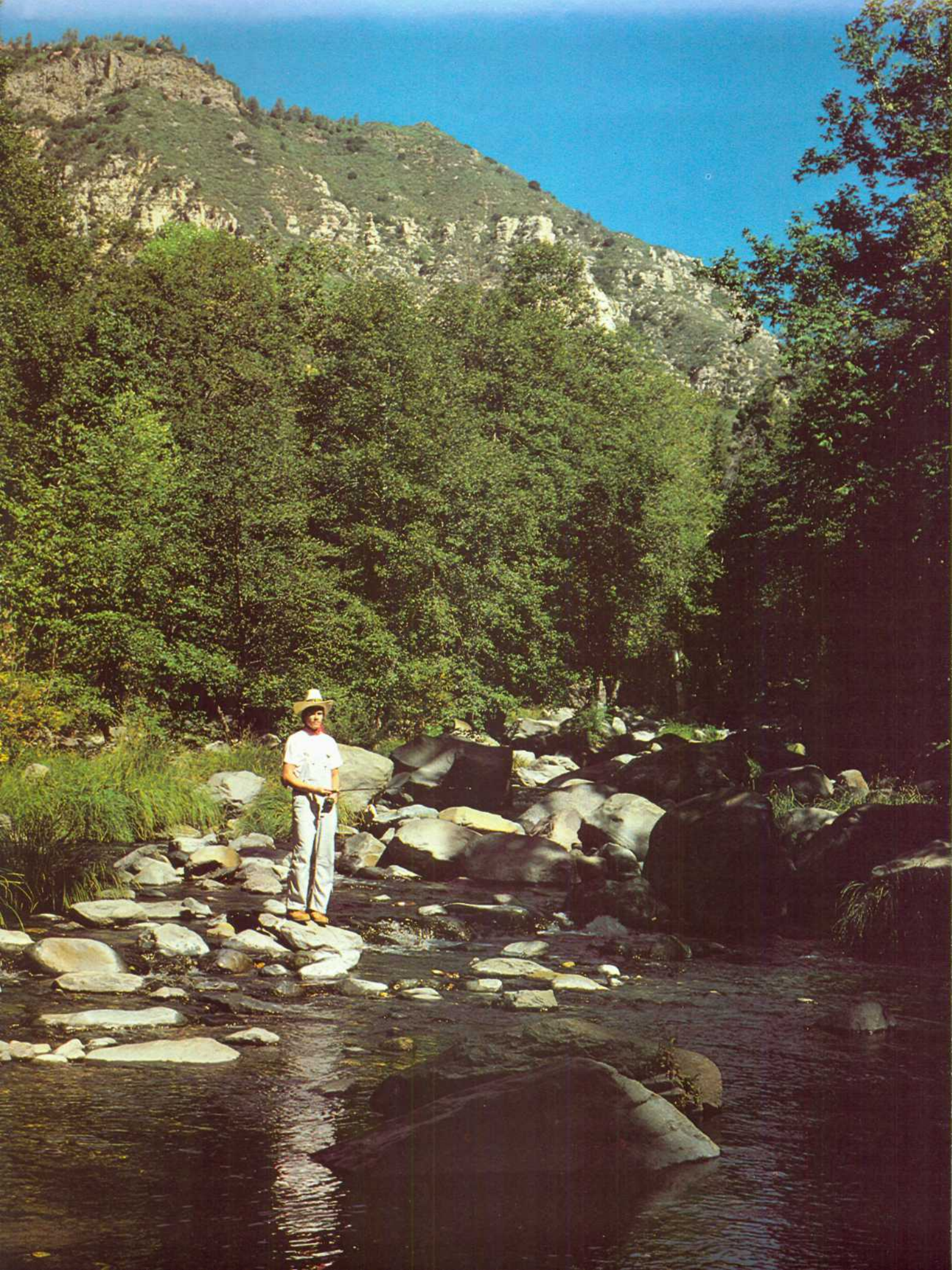
I reached the coffee shop and thumbed idly through a sheaf of post cards while I waited for a pot of tea and my 10 o'clock appointment. "Just look for an old cowboy," he'd said.

He shambled in, a few minutes late, and recognition came easily. Bob Bradshaw—writer and photographer—has served as liaison, stand-in and movie





From left: One of Sedona's children enjoying an Oak Creek apple. Bill Garland with a local weaver. Ray Glade, local historian and author. Mary Margerite with the tool of her trade.



SEDONA

Continued

extra for virtually every movie and television company that has selected the scenic Sedona Valley for shooting. When he arrived from the midwest in 1946, Sedona was "just a wide place on a pretty rough road."

"It had one grocery, a little post office and a population of 300. The land wasn't worth anything. No water. No industry. There were ranches of all sizes and farmers with fruit and small truck crops. What little water there was had to be hauled up from the creek bottom."

But in 1948, deep water wells went in, and by 1950, people began to find their way to Sedona more frequently. The way wasn't easy—that was before the freeway went in over at Black Canyon, and the trip from Phoenix wound tediously through Wickenburg, Prescott and Camp Verde.

Today the town is an intriguing mixture of tiny summer cottages set back among the cedars, well-groomed luxury homes which blend into their rocky promontories or hug the red earth with an eye to inconspicuous living and starkly modern structures which hold well the Western flavor of the earlier buildings. Residents, visitors and even those passing through, sense a simple air, a down-to-earth hominess that contrasts with the elegance and polish of more urbanized locales.

But Sedona's tranquil mien gives little indication of the behind-the-scenes vitality. Enthusiasm bubbles along and keeps the town growing in its well-supervised manner.

You see, all the folks in Sedona feel they have a personal responsibility to keep things from getting out of hand. A few years ago, a small group of volunteers came together, adopted the slogan "Keep Sedona Beautiful," and set out to do just that. Their first self-appointed chores included picking up litter along the highways and in the picnic and camping areas. They also suggested a control of size and design of business signs in town. Their influence has grown and is felt in every area of planning and zoning. It is shown through the presentation of awards each year for the best building and the finest examples of landscaping in town.

This is a close-knit little village. A serrated band of brilliant red, pink and buff rock—the monuments of Oak Creek Canyon—surrounds the community and sets the tone, dictates

Catching dinner in Oak Creek.

the atmosphere for a way of life. The town itself echoes the landscape theme with buff stucco, dark brown rough-cut beams, red rock chimneys and walls with the red stone marbled like a side of good beef.

Sedona is crosshatched by groups of volunteers doing hardcore civic work. Eighty percent of the population is made up of retired, fairly substantial people who have chosen this beautiful place as home and who have time for service work. They recognize the inevitability of growth; some predict 20,000 people in 20 years.

"We drove through Sedona on our way to the Grand Canyon four years ago and stopped for about 15 minutes. Went on to the Canyon, then went home to Michigan, sold our house and came back to stay."

Richard Riley

"There's no way to stop it." William Garland, whose sons now run Garland's Lodge, sipped at a cup of his wife Georgiana's coffee, scratched Bud's ears as the big Doberman lay down beside the office desk, and went on talking with an assured pride about his hometown.

The best thing for the future and for the community is to direct that growth; to plan ahead. There's not an empty store in town, and you've seen how far down the valley West Sedona extends."

Sedona's growing, all right; and there are problems, even with all the individual and collective enthusiasm, hard work, and know-how. Sewage is a chief concern. Incorporation problems must be smoothed out. A law or two must be changed to allow incorporation over a county line because Sedona is bisected by the Yavapai and Coconino county lines.

Every weekday morning, school buses carry children in different directions. Some secondary students make the 30-mile trip north through Oak Creek Canyon, up the switchbacks and through the snow, to Flagstaff High School. The other students, across the line in Yavapai County, attend school in the warmer environs of Cottonwood. Grade schools? There are two. Both in town; both in different counties.

County taxpayers' groups and the

Sedona Chamber of Commerce have solid voices in community affairs and in decision-making. Citizen volunteers act as watchdogs in areas of growth. A nucleus of old-time businessmen have informal get-togethers when the occasion warrants.

On the surface, Sedona sounds like any small town caught in the throes of growth and development. There is another element which must be considered though, to understand the unique quality of the little place tucked away so quietly among the cedars and decorated with summer's blue lupine and Indian paintbrush. It is a mecca for working artists of every genre.

Hollywood discovered Red Rock Country in 1924, and since that time, a long list of movies has been ground out with the magnificent Arizona landscape serving as backdrop. *The Rounders*, *3:10 to Yuma*, *Broken Arrow*, and *The Cowboy and the Redhead* are mere samples of well-known Sedona-based titles. From the land of high-rise coastal condominiums, acres of commercial developments and controlled recreation, countless companies arrive to shoot television commercials among the great buttes and in the red dust along the banks of Oak Creek.

"I don't think we've missed a beer company or a cigarette commercial, yet," mumbled the taciturn Bob Bradshaw.

Sedona boasts no brawl of neon or noise. Places which are intensely urban, cacophonous, swarming with jangled nerves and cluttered souls, lie far beyond the imagination in this small Western place. Life rests easily upon the land and the people. A creative spirit touches those who observe the serene, almost pastoral quality of its stillness.

A fragile, luminescent moment touches day's end and highlights extraordinary patience. A last flare of sunset rouges the red buttes to an even deeper hue. Winter twilight comes early and steals along the erratic design of streets with startling silence.

In this place where Nature's handiwork is an integral part of man's urbanization, it seems incongruous that a broad band of worldly sophistication would be woven through the entire fabric of daily living. But it is there, as surely as the Art Barn will open for another season, or the *RedRock News* will discuss the merits of the St. Patrick's Day Celebration and the Lion's Club Carnival over the Fourth of July.

Those in search of a place to exercise an artistic bent found that the elegant

SEDONA

Continued

solitude of Sedona lent another dimension to their creative lives. A few decades ago, the area became an artist's colony. Writers, painters and sculptors daub, peck and pound away in studios of every description. The Sedona Art Center reaps the benefits of outstanding local shows, private classes and seminars directed by the talented folks.

From the surrealistic works of Max Ernst to the cowboy art of Jim Reynolds, Frank McCarthy and Joe Beeler; Sedona can show the most prestigious of works.

The Sedona Art Center, housed in what had been a tumble-down apple-packing barn, is the only cultural organization in the entire area, and the responsibility is keenly felt. The center, an artists' and craftsmen's guild, offers drama, music, painting, sculpture, ceramics, photography, stained glass and quilting.

What began as the dream of sculptor Nassan Gobran in 1950, when he arrived from his native Egypt, has developed into a center with influence throughout the Southwest. It has been realized through the efforts of Director Lucy Banks and a veritable army of talented volunteers giving lavishly of their time.

At Oma and Lee Bird's Oak Creek Tavern in July, 1965, the Cowboy Artists of America was founded by George Phippen, Joe Beeler, Charlie Dye, J.W. Hampton and Bob McLeod.

Small music ensembles—from chamber music to jazz performances—keep the old barn crowded; studios and classrooms, galleries and dance rehearsals guarantee interest and industry for everyone.

The haunts and habits of Sedonans vary from picnicking at Slide Rock up in Oak Creek Canyon, to luxurious dining at posh resorts like Poco Diablo, from an international shopping spree at Tlaquepaque (T-laḥ-kee-paḥ-kee), to dancing country swing or rock at Oak Creek Tavern, or hunting and fishing in the hills and canyons surrounding the boardwalks of main street.

Now, don't get the idea that the Lady of the Red Rocks suddenly appeared full-grown, sporting plans for expansion and all dressed up in her 20th Century finery. Ask Albert Thompson. His parents took squatters rights up at Indian Gardens in 1876, and Albert has seen a multitude of changes in his lifetime.

Talk to Don and Nita Hoel who were

instrumental in the late 1940s for bringing electricity to Sedona and Oak Creek Canyon; and to Jennie Lee van Deren whose father got the Forest Service to allow homesteading by veterans of World War I in the West Sedona area. Dick Duncan has fed folks in Sedona for years. The Pink Jeep Tours has built

The town itself echoes the landscape theme with the buff stucco, dark brown rough-cut beams, red rock chimneys and walls with the red stone marbled like a side of good beef.

and maintained backcountry trails for 22 years, and Lovey Munday has been a gracious tour guide and faithful driver of the little pink rock climbers for 10 of those years.

The natives don't go away. They stay and extend a quiet, Western welcome to the newcomers.

"What is a Sedona?" asked Vic Lamb in a column of a special edition of *Red-Rock News*. It is a group of volunteers turning a hand to the running of their town, trying to preserve the old values of strength and integrity, while making plans for creative growth. There is something self-preserving about the charm and beauty of the area, for it is a near-perfect retreat from the pressures and tensions of the world's great marketplaces.

But there are many places in the world dripping with natural beauty and the quiet of the ages; many places with good golf courses and racquet clubs, garden and Elks clubs, parades and rodeos, art galleries and nature trails, carnivals and running events.

Sedona is more. It is a place of renewal.

Birds swarm, nesting in the pine and cedar forest along the creek banks and in the chaparral of the mountain slopes. The land is loud with the cries of quail scuttling through the underbrush. Small animals and rattlesnakes come out from whatever dark recesses they have inhabited. A gentle restraint falls upon the inhabitants of the community in the Red Rocks. Many a gaze wanders from the business at hand up toward the massive buttes rising at the edge of town.

Indeed, it lacks the *sine qua non* of any progressive, up-and-growing, self-


respecting American municipality: a business district filled with the glittering splendor of flashing bulbs and neon tubing.

When dusk gently flows over the ridge above the highest homes on the slopes and down through the streets, the town reflects the quiet and subdued attitudes of her people and retains the soft and lovely atmosphere with which she began.

During the course of two centuries, the men and women who explored, settled and exploited the land left their marks on it in many ways. When Ellsworth Schnebly offered the name of his sister-in-law, Sedona, for the new post office in 1902, he said it stood as an example of high character as well as "rich inner fortitude that was both compassionate and sensitive."

Sedona is all that, even in this time when great, lumbering machines move through the cedars and manzanita. Work on a new roadway, homesite or business changes the red earth. There are still cowboys on the ranches, horse-men quick with a rope and handy with a branding iron.

Sedona is also vast, awesome and filled with fantasy and stimulating thoughts of nature's magnificence. There is time to work and to reflect, to plan and to dream, to put a hand to the task and to sense the timelessness of the quiet moments that measure the greatness of man.

The hiker jabs the crooked walking-stick into the creek bank and wonders how to describe the comfortable intimacy, the magic privacy, of another small Western town. Of Sedona. Of a place where the treetops in the wind talk huskily, telling fortunes and histories, where two girl-shadows play on the creekside and summer heat shimmers off the red buttes above. 

Virginia Greene was born on the desert at Yuma and was educated in the mountains of Flagstaff, earning both her degrees at Northern Arizona University. She remained to teach English at the university and to begin raising her children "in the shadows of Red Rock Country and under the sycamores in Oak Creek Canyon."

A freelance writer and frequent contributor to Desert Magazine, her work also appears regularly in Arizona Highways, Ford Times, and in-flight publications.



OUR DESERT HERITAGE

Desert magazine Archives



The theme for this issue is community, and what could represent the desert community better than the Death Valley '49ers? Each year the association of Death Valley '49ers celebrates the pioneer spirit and the heroic enterprise that created this community. The pictures shown here are from the 1953 re-enactment and show the prospectors participating in the Burro Flapjack Sweepstakes. Spectators look on as the men and their animals compete for the prize. For complete details and an update, see page 36.

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One day in the world
of a wildlife refuge.

Introduction by Frances G. Smith

Essay and photography by Jeff Gnass

Bosque Del Apache





Bosque del Apache. The very name brings to mind bands of Apache camped in cottonwood groves, along the banks of the Rio Grande where it flows south through central New Mexico. Located near the foot of the Magdalena Mountains at the edge of an arid plateau, the Bosque del Apache National Wildlife Refuge is like an oasis in the desert. It abounds in wildlife as it did in the days of the Apache. Not only does it offer grasslands, fields, ponds, marshes and wooded areas for its numerous residents; it provides a stopping place on the central flyway for thousands of migrating birds. There is an abundance of grain: Out of 57,191 acres, 1,500 acres are farmed to produce food for the wildlife through cooperative farming efforts. One-third of the 1,500 acres is planted in grain, which is left standing as food for the birds. The other two-thirds are planted in alfalfa, which is harvested by the farmers. The stubble from the alfalfa is left to be used by geese and cranes through the winter. Annually, over 295 species of birds, as well as many mammals, can be seen here.

I arrived at the Bosque on a frosty morning, well before sunrise. With my early presence, I hoped to witness the unfolding of dawn and the fantasy of a colorful sunrise. In the pre-dawn light, I quietly located a pond filled with roosting sandhill cranes and snow geese. There, I set up my photography equipment and waited.

As the first signs of dawn appear, snow geese begin stirring out on the glassy wetlands. Small flocks soon silhouette the fiery sky. Dawn gives way to the sun's first rays. Dabblers, bobbing and feeding in the shallow water, are in evidence everywhere. The new day approaches definition as sandhill cranes awaken at their roosts. The morning sky is already filling with huge, undulating formations of white snow geese enroute to feeding grounds up and down the Rio Grande Valley. Occasionally, a gaggle of Canada geese flocks and lands a short distance away. After a period of stretching and fussing about, the sandhill cranes begin taking flight. First one or two, then in groups of three, four or five—they leave their roosts for the grain fields. With an exciting session of photography completed, I too take leave, to explore more of the wildlife and habitat of this place called the Bosque.

Morning advances. Multitudes of black birds accent naked tree branches. Songs are sung while cattails, too, provide temporary resting places. Among the grasses, colorful male ring-necked pheasants dart about, ever wary of closer investigation, while the ever present roadrunner offers the persistent observer a rewarding show of antics.

Clockwise from upper left: The colorful ring-necked pheasant stands among the grasses. A mule deer looks on from the tall reeds. Sandhill cranes roost in the pond. A coyote feasts on a freshly-killed snow goose.

Along ditches and in shallow ponds shy great blue herons continue their silent vigil, fishing the day away. Late in the morning I spot a small herd of mule deer. One doe is especially idyllic, peering from tall reeds, ears at attention, as she captures every sound of her photographer.


One doe is especially idyllic, peering from tall reeds, ears at attention, as she captures every sound of the photographer.

The low winter sun transits the meridian, and the day warms. I am soon awarded my most exciting sight of the day: A coyote, dressed in a fine winter coat—feeding—standing over a freshly-killed snow goose. Determined to continue his feast uninterrupted, my activities are closely regarded. A Swainson's hawk, undoubtedly envious of the coyote's good fortune, also watches from his perch in a nearby cottonwood. The coyote finished his meal, seemingly undaunted by our presence. Looking content and acting playful, he stalks away through the grass.

Afternoon brings a glimpse of several whooping cranes. These magnificent birds were recently near extinction. Fostered by sandhill crane parents, a new migrating flock of "whoopers" is now being developed. They commute alongside the sandhill cranes in their twice-annual migration between the Bosque and Grays Lake in southeast Idaho.

As the afternoon wanes, Canada geese are about, feeding among the grasses and swimming in the ponds. Shovelers and other ducks mingle freely and feed out on the flooded marshes and wet-

lands. Shadows grow longer and the land takes on yet another dimension.

Bathed in the magical light of late day, grasses and reeds are accented with a golden hue. Reflections grace the mirror-like surfaces of calm waters. To the west, a restless sun lingers no longer and slips beyond the outline of the Magdalena Mountains. Conversations between sandhill cranes flocking to roosts fill the night air with their constant uttering of "krooos." Cranes decorate a fading twilight as dusk rapidly approaches—yet I linger. Night descends and the hushed sounds of contented waterfowl drift over still waters. Quietly, I prepare to leave, reluctant to see the end of a most exciting day at the Bosque. 

Jeff Gnass is a 34-year-old freelance photographer. Currently working out of Northern California, he photographs the outdoors of western North America. His work appears frequently in *Desert* magazine, *Arizona Highways*, *Nevada* magazine, *American Forests* and the *Sierra Club* Calendars.



Frances Smith teaches Chemistry at Santa Monica College. She is fascinated by all areas of science and nature study. Whether she is explaining the way molecules escape from the surface of a pool of water, or describing a visual experience like snow geese alighting on a pond; her goal is to share with her students and readers the excitement she feels about the world around her.





Death Valley Helen, Ramblin' Roger, Calamity Kris, Bonna Norris, Calico Kate and Calico Dora pose in group revelry.

Reliving A Community From Our Past **The** **Death Valley** **Encampment**

Text and Photography by Jack C. Whitt

A member of the original 1849 pioneer party described the silence of the desert as *awful*. However, in our noisy existence, many people count silence as a precious commodity and a blessing. Entwined, the desert and silence seem as twin brothers, united in the purpose of peace. Sand dunes glimmer blindingly; the Grapevine Mountains stand in hues of midday blue, purple and violet; tamarisk canopies are backlit in the low autumn sun. The warmth of Death Valley sunshine soothes the sun-questing soul.

Supervised by the Death Valley '49er organization and the Superintendent of Death Valley National Monument, four days of activity known as the Death Valley Encampment attracts thousands of visitors each November. It's a festival, and scores of folks have gathered to celebrate a pioneer heritage in a below-sea-level trough that sits between two stark desert mountain ranges. Choices of activities include an overnight hike, campfire programs, live old west and bluegrass music, a fiddlers contest, chuckwagon meals with guest speakers, a golf tournament, natural history tours, pony-drawn covered wagons, the Death Valley Trail Ride (horses) and the comical Burro Flapjack Sweepstakes.

Grown men pull grown burros from the perimeter of a circle toward a center



The Reinsmen entertain with old west campfire melodies and humor at Stove Pipe Wells Village.



Calico Kate models her dress and parasol.

post. After circling the post, man and burro return to their original starting positions. Once back, the man must load the necessary flapjack fixin's onto the back of the patient burro. Man and burdened burro head for the center post again, recircle it and again return to the starting position. Upon the second return, the man immediately unburdens the burro, starts a fire, greases a griddle and mixes and fixes flapjacks. The first man able to induce a flapjack into a burro's mouth is declared the winner.


Big Jim Smith, from Barstow, California, won the 1980 Burro Flapjack Sweepstakes and \$100 in prize money. He has won the race in years past, and "wanted to show the kids what the old man could do".

Color, character and nostalgia are elements of the Death Valley Encampment. A small group of innovative seamstresses produce authentic-looking, historic costumes, which they wear all day long at the festivities. Changes in attire each day produce an endless barrage of photographic requests and possibilities. These gracious folk profess their own desert names in good fun; Calamity Kris and Ramblin' Roger, or Calico Dora, the showstopper, who is noted for her beautiful hats.

Perhaps the queen of the celebration is Death Valley Helen. Displaying an authentic 60-year-old, hand-sewn lawn coat for only the sixth time (appraised at \$500), she declared, "I've spent a fortune collecting antique clothes." She is also proud of her 25 pairs of antique shoes. For 17 years, she has been coming to Death Valley during the Encampment, where she wears her dance-hall girl/madam type costumes. When asked of her most exciting experience associated with Death Valley, she replied that it was when she received a commendation from the Death Valley '49er's board of directors,

for her work and contribution. In 1981, a humorous collection titled, *Death Valley Helen Tells This*, will be published. Death Valley Helen plans to spend much of her time in Calico, "living there and telling tourists about things," as her calling card states, "Till the restless sands are silent."

Costumes, music, competitions and historical interest in the desert combine to make the Death Valley Encampment entertaining, informative and fun.

The Encampment this year will be held from November 11th through the 14th. 

"Supreme symbol of the Southwest, the saguaro is a giant among cacti, a 20 to 50-foot high fluted column of chlorophylled plant flesh that comes in as many different shapes and sizes as human beings do. Like planted people, individual and idiosyncratic, each saguaro has its own form, its own character, its own personality. Or so it seemed to me then; and now, 25 years later, it still does. When nobody is around, I talk to them. On simple subjects, of course." Edward Abbey — Cactus Country.

To anyone strolling past it would appear that I was talking to the old saguaro towering over my campsite. I have been known to talk to my automobile—at least the cactus is alive! Actually, I really was attempting to cajole a gila woodpecker into making an appearance in her nest hole located midway up one of the taller arms of the saguaro. Camera, tripod, 400mm lens—all waiting to capture her carrying some tender insect to her chicks. I have been visiting this spot regularly for 11 years, photographing the comings and goings of birds and other creatures around this particular many-armed saguaro. It really is an avian apartment complex; five stories tall with at least nine nest holes drilled over the years by woodpeckers. At the moment, the woodpeckers and a pair of house sparrows, nesting on the "first floor," were the only occupants.

Saguaros are endemic to the Sonoran desert of Arizona and Mexico. They are the largest cacti found in the United

States, second only in size to the similar but heavier cardon of Mexico and Baja California. The saguaro is supported by a woody skeleton of long, slender rods arranged in a circle. Each rod is as long as the plant is tall. Within and around this circle lies the softer, water-storing tissue of the plant. At any given time, 75 to 95 percent of the six-ton weight of a mature plant may be water. Saguaros have a relatively short taproot, but the many lateral roots, a foot or so beneath the surface of the ground and 100 feet in any direction, help anchor it against the

I've been visiting this spot regularly for 11 years. It is an avian apartment complex; five-stories tall.

wind. In essence, they sit in the center of the spokes of a wheel of roots. The shallow roots take advantage of the moisture from the lightest rain. After one rainfall, the accordion-pleated surface of the saguaro may expand up to 50 percent, bulging with stored moisture. Even if it doesn't rain again for two years, the saguaro has stored enough water to survive. Exceedingly slow growing, a saguaro may be only a quarter of an inch tall at the end of one year, six inches after nine years, 10 feet after 40 years and 50-70 feet by the time it is

fully mature at nearly 200 years of age.

These sentinels of the Sonoran desert are the center of activity for a wide variety of animals. The plants both shelter and feed an incredible assortment of creatures. I have made most of my journeys to Organ Pipe Cactus National Monument (see page 56) in late spring when the saguaros are flowering and the birds are nesting. The activity around *my* saguaro is so frantic that I usually go through three to four rolls of film every morning just trying to capture some of it.

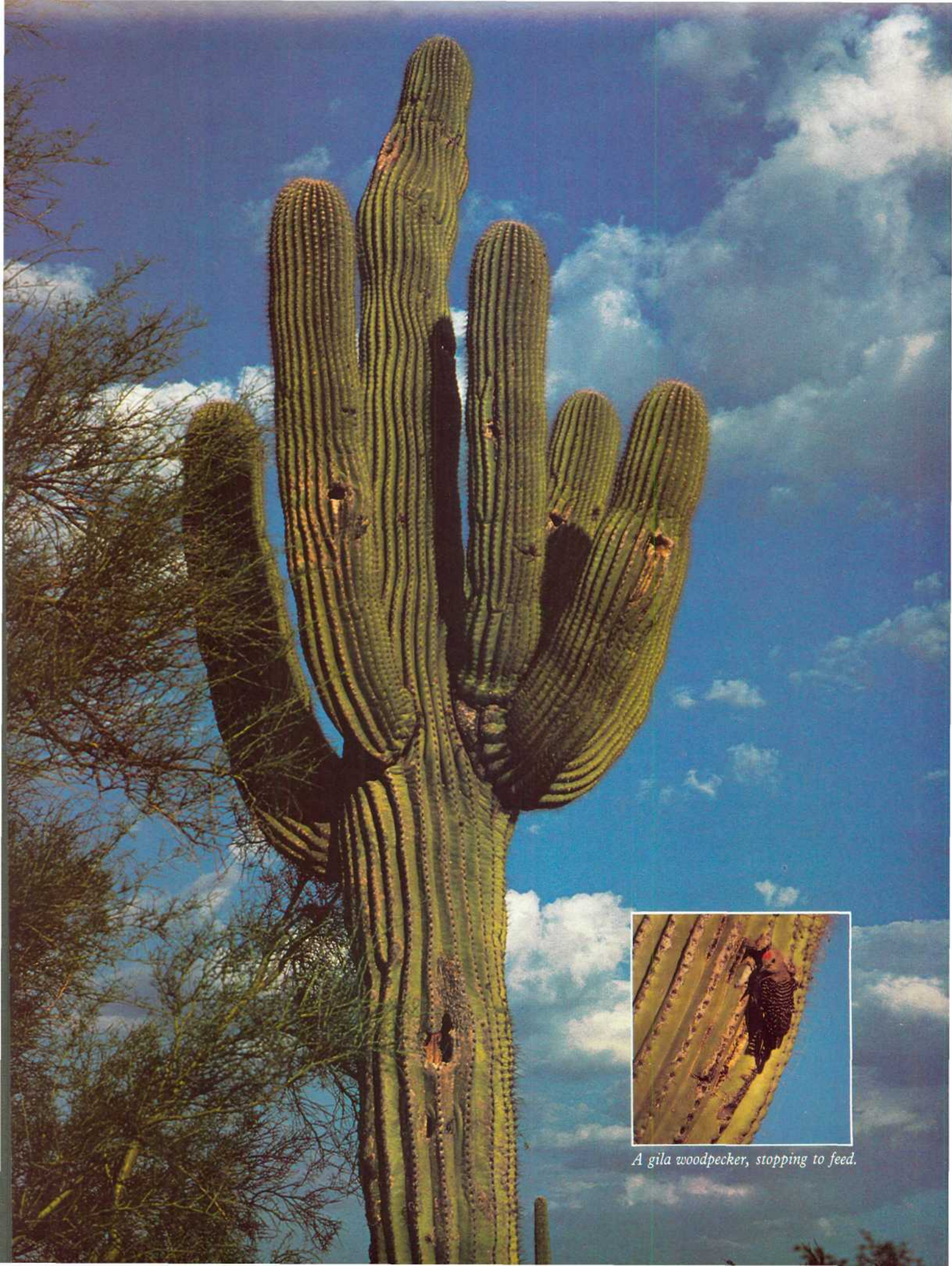
In May, flower buds appear. The flowers, when fully open, will be two to three inches in diameter and have a white and waxy appearance. While the flowers contain both the male and female organs, most are self-sterile, that is, they need to be fertilized by pollen from flowers on other saguaros. A team of researchers—S.E. Macgregor, S.M. Elcorn and G. Olin—set up a scientific study to learn how saguaro flowers are pollinated. I just sat and watched. We agreed that the most obvious visitors to saguaro flowers are honey bees. However, while the bees pollinate the flowers, they were only imported and released into this country about 100 years ago. Originally, saguaros would have had to rely on other methods. In the spring, white-winged doves migrate into the saguaro forest from Mexico. During the flowering period, the doves seem to be wearing a soft golden hood, the result of plunging their heads down into the center of the flower to drink the

These spiny giants are home to wildlife of the desert.

Text and photography by
Karen Sausman

A Community Affair

THE SAGUARO



A gila woodpecker, stopping to feed.



Large birds-of-prey, such as red-tailed hawks, often build their nests in the arms of the saguaro.

nectar and coming up covered with pollen. As they move from plant to plant they pollinate the flowers. I have photographed woodpeckers, Bendere thrashers and other birds enjoying the nectar—the birds and saguaro both benefiting from the relationship.

Since most cactus flowers tend to be open at night and closed by late afternoon, it would seem that some nocturnal animals may also assist in the pollination of saguaro flowers. The researchers discovered that the flowers attract long-nosed bats. While most species of bats are insect eaters, the long-nosed bat prefers nectar. Their elongated faces are highly adapted for reaching deep into saguaro flowers. The bats, like the white-winged dove, are soon dusted with pollen which they spread from flower to flower. Of all the pollinators studied, the bats accounted for the greatest number of successfully fertilized saguaro flowers.

The activity around the saguaro continues as the fruits start to mature. Saguaro fruits are oval—two to three inches in length. As they ripen, the

fruits split open into three sections. In the center is a large mass of juicy, red pulp and thousands of tiny, black seeds. Insects, rodents, coyotes and man are attracted to the sweet, seed-filled pulp. The Papago Indians have harvested the fruits for centuries.

Perhaps the greatest consumers of saguaro seeds are harvester ants. They methodically gather up hundreds of

At any given time, 75 to 95 percent of the six-ton weight of a mature saguaro may be water.

thousands of seeds and take them to their storage chambers deep underground. This is too far below the surface for the seeds to have the opportunity to germinate. Many of the seeds consumed by large animals are simply passed through their digestive tracts unharmed and given a second chance for germina-

tion. Even so, of the 12 million seeds that a saguaro cactus may produce in its lifetime, no more than one or two will germinate and reach maturity.

Those saguaros that germinate on rocky slopes have the best chances for survival. The rocks trap moisture and shelter the young plant from sun and from the eyes of small rodents that would make short work of a pea-sized, year-old saguaro. When the plants grow larger, they are eaten by packrats who easily remove the spines and burrow into the soft flesh as much as if it were a cucumber.

Let's go back to the apartment complex located at campsite number 13, Organ Pipe. Two birds are responsible for excavating nest sites in saguaros—gila woodpeckers and flickers (both red-shafted and gilded). Woodpeckers, of course, have been building nesting holes in trees for thousands of years, and so it is no surprise that they do the same thing in saguaros. When the woodpeckers drill into a saguaro, they make the hole about three to four inches across. They start to excavate down into

the plant, so that the opening actually winds up well above the floor of the nest. The saguaro responds to the invasion by gradually lining the hole with scar-tissue which makes a smooth interior. So tough is the calloused tissue that it remains behind long after the saguaro is dead. Nest holes, commonly called *saguaro shoes* can be found intact among the decaying tissues. Joseph Wood Krutch wrote in his *Voice of the Desert* that, "The Sonoran Desert must be one of the few places in the world where one may come home from a walk carrying a hole."

The end product of the woodpecker's work is a nest site which is high above the ground. It is dry and well insulated because the water-storing tissue of the saguaro keeps the nest relatively cool during the heat of the day and warm during the cool evenings. Each season the gila woodpecker builds a new hole. Within their excavated holes, these birds may raise as many as three broods a year. The holes they abandon at the end of the nesting season are usually taken over by other birds who cannot build their own.

The elf owl, the smallest owl in the world, is just one of 16 species of birds known to occupy old woodpecker nests in saguaro cactus. In addition to the elf owls, the following species have been found nesting: screech owls, pigmy owls, sparrow hawks, Bendire thrashers, cactus wrens, ash-throated flycatchers, Weid's crested flycatchers, western kingbirds, Lucy's warblers, purple martins, western bluebirds, house finches, English sparrows, lark buntings and starlings.

Birds aren't the only ones that use the holes. White-footed mice line saguaro holes and raise their young. Bats roost in the holes during the day. Honey bees and wasps create their cone-like nests in and around the holes and arms of the saguaro. Perhaps one of the most incredible uses of the holes are as breeding places for the "saguaro mesquite." Really! Some of the holes are situated so that when it rains, water runs down the cactus and into the hole providing the small pool needed by mesquite larvae. During the dry season, it is not unusual to see birds flying from one saguaro to another searching the holes for water to drink.

There are some species of birds that nest on saguaros, not in them. Large birds-of-prey such as red-tailed hawks and great-horned owls often build their nests cradled in the arms of the saguaro. A mass of sticks and twigs, which may be more than three feet across and four

feet deep, the nest may be used year after year.

In my many visits to Organ Pipe, I often spend hours photographing the animal activity around the saguaro. What usually attracts my attention are the bigger things: birds nesting and feeding on the flowers and seeds, a jack-rabbit sitting in the shade or even a packrat's nest at the foot of an old saguaro. During my last visit, I decided to look at another part of the saguaro community—the decaying remains of old and wind-fallen saguaros. The night before this particular visit, there had been a violent summer rainstorm. The canyons and washbeds roared with water. In the morning everything smelled fresh and green; the earth was warm and moist. As I started exploring, another segment of the animal community associated with saguaro made itself known. The first thing that caught my eye was the activity of some side-blotched lizards that were perched basking in the sun on decaying saguaro ribs.

Of the 12 million seeds that a saguaro cactus may produce in its lifetime, no more than one or two will germinate and reach maturity.

When it got too hot for them, they would disappear into the tissues of the cactus. I thought to myself, "they are looking for insects." I followed their example. Lots of ants were making their trails in and out of the old saguaros. After poking around in a couple of saguaro skeletons, I came across the creatures that must be attracting the side-blotched lizards and probably many other species of lizards as well. Small, one-eighth-inch-long termites were tunneling through the decaying plant material. My interruption caused a great frenzy of activity. Their soft white bodies could not stand exposure to the desiccating rays of the sun. Worker termites were darting here and there trying to find a way underground. At the same time, the soldiers were emerging with their ivory white bodies and bright rust-colored heads. Their huge pinchers were prepared for the enemy to attack. After photographing them, I turned the pile of debris back over and let the termites continue with their important job of digesting plant material and ultimately recycling it back into the earth. The next creature I

found chewing on a decaying saguaro was a six-inch-long giant millipede. Shiny and black/brown, it was working its way through the plant material. It, too, didn't seem to appreciate my interruption. When I tried to maneuver it into the sun for a picture, it waved its antenna and stood a third of the way up as if to get a better look at me. Eventually it curled itself into a protective ball—quite unphotogenic.

One particular species of insect poses a threat to the saguaro: a tiny unobtrusive moth—*Cactobrosis fernaldalis*. This little moth passes its larval stage in a saguaro's tissues. Unfortunately, it carries a species of bacteria which, when introduced into the saguaro, causes the plant's tissues to liquify and turn into a soft rotting mass. If the necrosis continues to spread, it eventually kills the plant. Saguaros try to produce a callous wall of scar-tissue around the injuries, walling off the diseased tissues from the unaffected ones. As the larva from the moth moves about the saguaro, it spreads the disease. The disease can also be spread as the infected, liquified tissues drip directly onto other saguaros or even on to the ground where the bacteria can travel to other plants.

Saguaros, towering centennials of the Sonoran desert, have captured people's imaginations for centuries. They are the symbol of the American Southwest. But more than that, they are the central point of an intricate community of animal species. Creatures consume the flowers, the nectar, the seeds and the soft tissue of the plant. They nest in and on the plant. They depend on it for moisture and for protection from the sun and predators. The delicate balance of the saguaro and the species of animals associated with it is just one of the many exciting stories of the fascinating desert.

Karen Sausman is the Executive Director of the Living Desert Reserve in Palm Desert, California. She has been associated with the Reserve for 11 years. Formerly



from Chicago, she received her BS degree from Loyola University and did her graduate work at Redlands University in California. She has been actively involved in the American Association of Zoological Parks and Aquariums for 14 years. She is currently editing a book for them and has been the editor of their newsletter for six years.

A photograph of sand dunes under a blue sky with mountains in the background. The dunes are in the foreground, with a large, smooth, light-colored dune on the right and a darker, more shadowed dune on the left. The sky is a deep blue with some lighter clouds. In the far distance, a range of mountains is visible under the same sky.

Sand Dunes: A Phenomenon Of Wind

Text by Wayne P. Armstrong

Wind and sand create majestic and sweeping dunes
that are constant but ever-changing.
They move across the deserts, sing to the wind
and inspire our own creativity.

The accumulation of wind-blown sand marks the beginning of one of nature's most interesting and beautiful phenomena. Sand dunes occur throughout the world, from coastal and lakeshore plains to arid desert regions. In addition to the remarkable structure and patterns of sand dunes, they also provide habitats for a variety of life which is marvelously adapted to this unique environment. Picturesque dunes against a sky of blue or a full moon—with perfectly contoured shadows of ripples and undulating crests—have always been a favorite subject of photographers. Dunes have also been the subject of many desert movies, and have historically been a formidable barrier to vehicular and rail travel. Depending upon one's particular situation, they can be the most incredibly beautiful, thrilling, eerie, treacherous or just plain inhospitable places on earth.

My personal love affair with sand dunes began as a child. Leaping off the tall crests and landing in deep, soft sand was more fun than any amusement park. One of my favorite sand dunes along the Oregon coast sloped directly into a cool, freshwater lake. I still enjoy hiking across dunes, but several painful landings on compacted sand, and numerous gritty mouthfuls of it cured me of the leaping syndrome. Over the years, I became fascinated with the formation of dunes and the amazing diversity of plants and animals that are able to survive on them. As a biologist, I am deeply concerned about the future of these animals and plants.

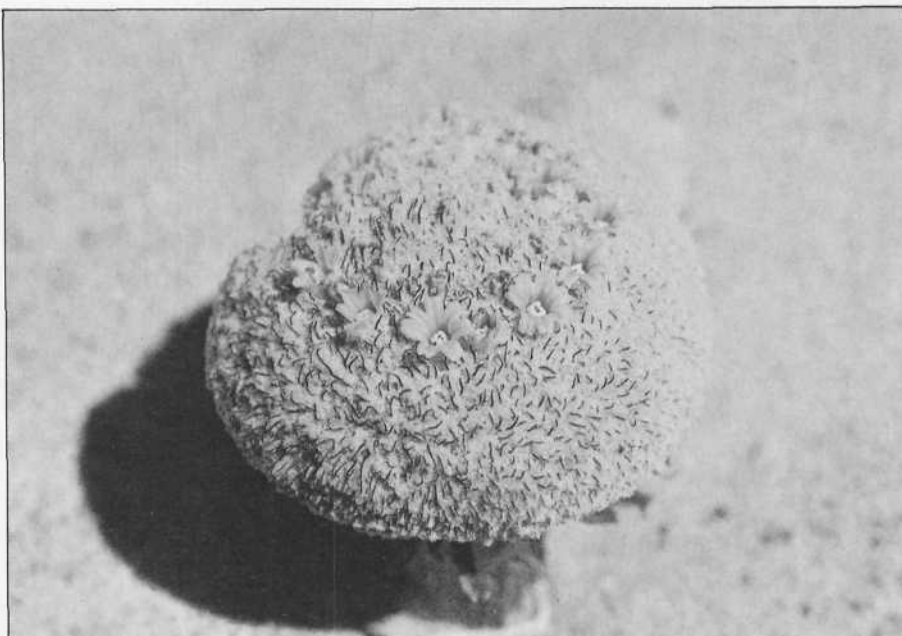
Although sand dune country can be beautiful and a lot of fun, there are some hardships that one must overcome. Depending upon the local wind conditions, length of your stay and your accommodations; perpetual sand in your hair, eyes, ears and navel can be somewhat annoying. Wind-blown sand seems to find its way into practically everything you own, particularly your camera. One of my lenses will never be the same. Every time I focus, there is a distinct crunching sound.

The origin and structure of sand dunes is very complex. There are three prerequisites: An abundant supply of loose sand in a region generally devoid of vegetation, a wind energy source sufficient to move the sand and a topography where the sand particles lose their momentum and settle out. Any number of objects—shrubs, rocks, or even a fence post—can obstruct the wind force, causing sand to pile up in drifts and ultimately large dunes. The direction and velocity of winds, in addition to the local supply of sand, results in a variety of dune shapes and sizes. The wind moves individual grains along the inclined windward surface until they reach the crest and cascade down the steep leeward or slip face. They pile up at the foot and slowly encroach on new territory. Some California dunes with crests only 30 feet high may advance 50 feet a year, posing a serious threat to nearby farms and roads.

Evidence of abrasion on sandblasted surfaces of telephone poles and posts reveals that sand grains seldom travel

more than a few feet above the ground. As the grains collide, some of their kinetic energy is transferred, setting up a series of chain reactions. Myriads of sand grains bouncing and rolling up the windward surface of a dune often form a series of ridges and troughs called wind ripples. Bouncing sand grains tend to land on the windward side of each ripple, producing a low ridge. Trough-like depressions develop on the leeward sides, primarily as a result of receiving too few grains. Coarser grains commonly collect at the crests of the ripples, because as ripples are built upward and are exposed to increasingly stronger wind action, the finer particles are removed. Stronger wind action also limits the height that sand particles will accumulate on the ripple crests. Without getting too complicated, the spacing of ripples is related to the average distance grains jump. This, in turn, is related to the wind velocity and size of the grains. Wind ripples are often very spectacular and photogenic, especially when the thousands of tiny ridges catch the shadows of early morning or late afternoon.

Many people associate deserts with Hollywood films depicting the French Foreign Legion, battles of World War II and other dramas. In fact, less than 20 percent of the earth's total desert area is covered with sand, and sand dunes only account for about two percent of the surface of North American deserts. One of the largest dune systems in the United States is the Algodones Dunes. It extends southeasterly for more than 50 miles—from north of Glamis in



Sand food, resembling a fuzzy mushroom, has tiny lavender flowers.

Imperial County, California to the southwestern corner of Arizona and into Sonora, Mexico. In California, the dunes range from two to six miles in width, with crests rising 200 to 300 feet above the surrounding landscape. Other large dunes occur in Death Valley, Eureka Valley and in the Mojave Desert near Kelso. The Eureka Dunes rise to nearly 700 feet and the Great Sand Dunes in Colorado rise nearly 800 feet. In the Sahara Desert, dunes may be well over 300 feet high and hundreds of miles long.

For centuries, explorers and naturalists throughout the world have described strange sounds emanating from sand dunes. Some of the earliest references, found in Chinese and Mideastern chronicles, date back more than 1,500 years. Marco Polo described strange sounds on a journey through the Gobi Desert, and Charles Darwin mentioned it while traveling through Chile. The sounds have been variously described as singing, whistling, squeaking, roaring and booming. Some accounts compare the sounds with distant kettle drums, artillery fire, thunder, low-flying propeller aircraft, buzz saws, bass violins, pipe organs and humming telegraph wires. Musical sand has been measured with sophisticated acoustical equipment. Low frequency sounds are produced when closely packed sand grains slide over each other, such as an avalanche down the slip face of a dune. The stationary sand underneath apparently acts as a giant sounding board or amplifier to produce the enormous volume of sound. High pitched "squeaking" beach sand is

common. Some beach sands will emit squeaking sounds by simply compressing the sand with your foot or poking it with a rod.

Depending upon one's particular situation, dunes can be the most incredibly beautiful, thrilling, eerie, treacherous or just plain inhospitable places on earth.

California has at least two documented areas with booming dunes; the massive Kelso Dunes of San Bernardino County and the scenic Eureka Dunes of Inyo County.

My first experience with booming dunes was at Sand Mountain, about 26 miles southeast of downtown Fallon, Nevada. A short dirt road, north of Highway 50, leads to the base of the massive white dunes. I didn't notice any loud sounds until I climbed to the knife-edge crest of a steep 200-foot dune and proceeded to slide down the slip face. Going down with an avalanche of sand is like riding down an escalator, only you're ankle deep in sand. Suddenly, I began to hear what sounded like a low-flying B-29 bomber or a squadron of World War II vintage fighter planes. The sound grew very loud and the sand beneath my feet and around my ankles vibrated like a mild electric shock. I tried to record the amazing sound on a

tape recorder, but most people think my recording sounds more like a swarm of bees or someone with a severe case of intestinal gas. I'm sure the local dune buggy enthusiasts thought I was completely insane, sliding down the dune while holding a microphone close to the sand.

I truly believe that sand dunes are one of the most beautiful and remarkable of all the earth's natural phenomena.

There are several interesting legends about the mysterious moaning of Sand Mountain. My favorite one tells of a large sea dinosaur or plesiosaur that once lived and frolicked with its mate in ancient Lake Lahontan. Strong winds piled the lakebed sediments into what is now called Sand Mountain, completely burying the dinosaur. Today the dinosaur moans for its mate and the deep blue waters of Lake Lahontan.

Even scientific explanations offer some puzzling questions for the origin of sounds of such magnitude. At least two things are certain about booming dunes: The sand must be very dry for sound production, and under high magnification the grains appear more rounded and finely polished than ordinary (silent) sand. In fact, many of the grains I have examined look like microscopic wave-worn pebbles along a beach.

If the wind direction is fairly uniform over the years, the dunes gradually shift in the direction of the prevailing wind. Vegetation may stabilize a dune, thus preventing its movement with the prevailing wind. Along the Oregon coast, entire forests may cover sand dune areas. Sometimes severe storms or other disturbances can destroy the forest canopy allowing sand from nearby dunes to move in. I recall climbing to the top of one dune and discovering the tip of an old, dead Sitka spruce protruding from the sand.

The mesquite tree (or shrub) is well-adapted to sand dune areas. As drifting sand piles up through the years, the mesquite plants grow with it. They eventually form extensive thickets of leaf-bearing, thorny branches above the dune. Below the sand surface, the bare and gnarled branches extend down to the trunks, buried deep in the heart of



Armstrong once followed a tiny set of parallel tracks for over half a mile, only to discover a large, black Eleodes (stinkbug) slowly wandering across the dunes.

the dune. The incredible root systems of mesquite may extend 50 to 100 feet in search of moisture.

During years with favorable winter rains and warm spring temperatures, a number of colorful wildflowers may appear in sand dune areas. I have seen

spectacular masses of pink sand verbenas, white dune primroses, bright yellow desert marigolds, blazing stars and purple dune locoweed, so thick that it is difficult to walk without stepping on some. The carpets of pink and yellow may extend for miles, and the air is

filled with the sweet aroma of fragrant blossoms.

My favorite dune plants are the bizarre root parasites which include sand food, pholisma and dune broomrape. They all have usual flower

Continued on page 62

A native American Indian culture survives and thrives.

Of Time and the Tiguas

Text and Photography by
Joseph Leach

Turning the clock back 300 years would be quite a stunt for most people I know. For me, a man of my time and my city, it is a simple matter of taking a 10-minute drive from downtown El Paso to the Zaragoza exit off I-10, and following the signs a couple of miles to a neighborhood called Ysleta. Driving that distance, I can feel the minutes slow down, and a different rhythm begins to engage me.

When you make the trip, you will also feel time and culture fade slowly away as you come to a stop at the Tigua Indian Tribal Center. It's a rambling cluster of stuccoed, adobe buildings alongside an ancient white church with a heavy bronze bell and silver tower. Leaving your car, you will enter the pueblo Indians' world of the 1680s.

I make the trip often, partly because I relish the sense of occasionally escaping from my own time. To do it means changing not only my tempo; it means, well, changing my sights, my angle of vision. At Tigua, I have to slow down, to be able to see.

Inside the Tribal Center's big wooden doors, I find to my right an up-to-the-minute restaurant alert to the traveler's thirsts and hungers. To my left is a large store with new Indian pottery and bright turquoise-and-silver jewelry, most of it made by young Tiguas themselves, some by other American Indians. If I were the usual tourist, glad to be here but already pressed to be somewhere else, I'd tip my hat to this shop as a place to check off my list of gifts to bring home, and in 20 minutes be back in my car and onto I-10 again.

Stopping only by the Tiguas' modern restaurant and shop, I would miss the greater pleasures and profits offered through another set of big doors leading into a sunny, outdoor arcade. In taking that other step, I leave behind the customs and trappings of my place and

my century. Here in a courtyard and dimly lit rooms opening onto the arcade, the Tiguas evoke the mud rooms under log and twig ceilings their forebears once occupied, and display the arts and the artifacts of their past.

As the displays suggest, that past partly begins in 1681; in another sense, it begins much farther back than anyone knows. According to history, the Tiguas came to this valley, forever renewed by the Rio Grande's brown waters, as a result of the bloody uprising in 1680. It was the New Mexico Indians against the Spanish colonials living in Taos, Santa Fe and widely scattered haciendas and villages. When the Spaniards living near Isleta del Norte (the Tigua Indian pueblo just south of present-day Albuquerque) fled for their lives to seek refuge with other Spaniards in Paso del Norte (now Ciudad Juarez, Mexico), they forced or willingly permitted some 400 Tiguas to come, too.

Bringing their tribal paraphernalia—most significantly their tribal drum—these Tiguas established their own community, Chiawipia. This land, situated a few miles downstream from Paso del Norte, was assigned by the Spaniards. The Franciscan padres helped them establish a Christian mission. That community survives as Ysleta del Sur, Texas, and its Indian heart is the present-day Tigua Indian Tribal Center.

At least that is history's story of their coming. According to the tribe's creation myth, the Tiguas began their earthly existence only 15 miles northeast of where they live now, at Hueco Tanks (*Desert*, May, 1981), a rocky outcropping in the Chihuahuan desert. As a nomadic people eventually moving throughout the Southwest as buffalo hunters and warriors, the Tiguas, at one time, lived 150 miles north at Gran Quivira, one of the New Mexico saline

villages (*Desert*, August, 1981). They then settled at present-day Isleta del Norte which is along the Rio Grande about 60 miles farther north. Thus, their coming south with the Spaniards in 1681 was not so much a beginning, but merely their arrival back home.

Whatever the facts, reaching this rich valley land and desert hunting range spelled the Tiguas' cultural emergence as a settled pueblo people. In the centuries since—the Tigua community celebrates its 300th anniversary this year as Texas' oldest uninterrupted social identity—they have held on to their fragment of earth against almost impossible odds. It is this compound of history and legend that the Tribal Center arcade presents to its visitors who come to observe and move on.

In the courtyard grows a small vegetable garden, in land that historical fact labels the oldest continuously cultivated farm plot in Texas. Inside a brush-covered arbor, lies an earthen dance area where young Tiguas now regularly present dances reminiscent of the steps of their ancestors. A separate museum building displays some of the paraphernalia of the tribe's elaborate religious rituals (most of which are not seen by the public). As I move past these various displays, they slowly bring me up to the present. The final room along the arcade features the sophisticated, authentically Indian pottery made by the Tiguas today.

The Center's arcade and small garden say much about the Tigua people; but the Tigua Indian community nearby, a

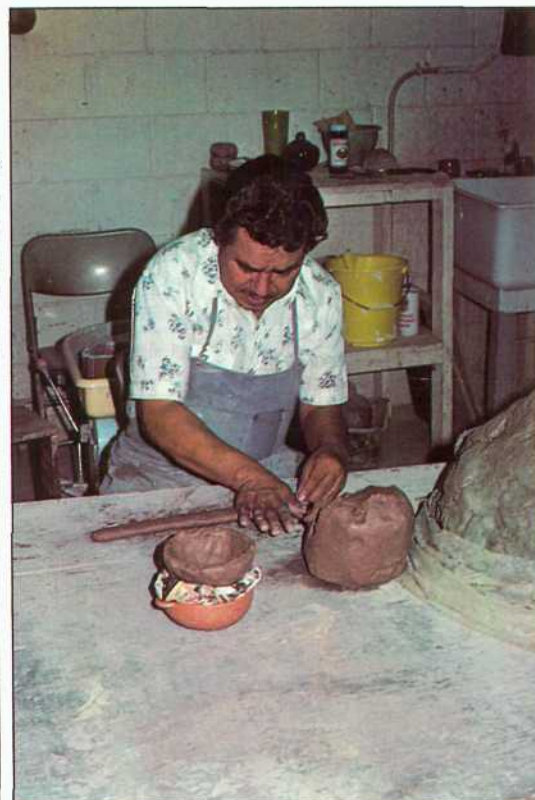
Above right: Herminia Silva directs, as bread bakes in the traditional outdoor adobe ovens.

Below right: Young Tiguas, dancers and craftsmen alike, learn the ancient Tiwa language.



Right: Master potter Alex Ramirez uses local red clay.

Below: The use of traditional motifs in their pottery has helped revitalize Tigua tribal pride.



residential area of 114 family units, says more. The pueblo-style houses are set in green yards with flowers and shrubs, and each has a carport shading a car or pickup. Glancing at them, I could assume that tribal mores are a thing of the past, but I would be wrong.

On June 13, the Tiguas still honor their patron saint, San Antonio, with ancient ceremonial dances in front of their church. They have retained their tribal political and religious formats, revere the land and its animals and still bake their bread in outdoor adobe ovens. They respect local herbs for their curative powers and desert plant life as nourishing food.

In a small, windowless building called the *tuhla*, the tribal elders (the *cacique*, war chief, captains and *mayordomos*) still preserve their sacred objects—buffalo masks, ceremonial canes and the tribal drum. Tradition insists that the drum came south with the original people. It is around this drum that most of the tribe's vitality still seems to revolve. Before important decisions are made, the elders "talk to the drum." Beating a slow, steady rhythm, whispering into a hole in its side, listening with ears attuned to insights far beyond words, the elders learn the long, mythic truths that function beyond everyday facts and figures.

Talking with Tiguas, I am assured they firmly intend for their culture to live. To do that, the people have always

had to reaffirm that conviction. In spite of the fact that King Charles V of Spain granted the Tiguas clear title to 36 square miles of land and river in 1751, their hold became tenuous as non-Indian, Mexican farmers plowed closer and closer, becoming increasingly greedy for easy access to the river and irrigation.

In my judgment, the most significant explanation for the Tiguas' new lease on life is their still-abiding conviction that they will preserve and pass on to their children the heritage their forebears passed on to them.

When Texas became an American state in 1845, the Tiguas's problem became more complicated. Texas entered the Union on a footing equal "with the original states in all respects whatsoever." Texas adopted the 13 original states' hands-off unconcern for their Indians, and ignored all her aboriginal peoples.

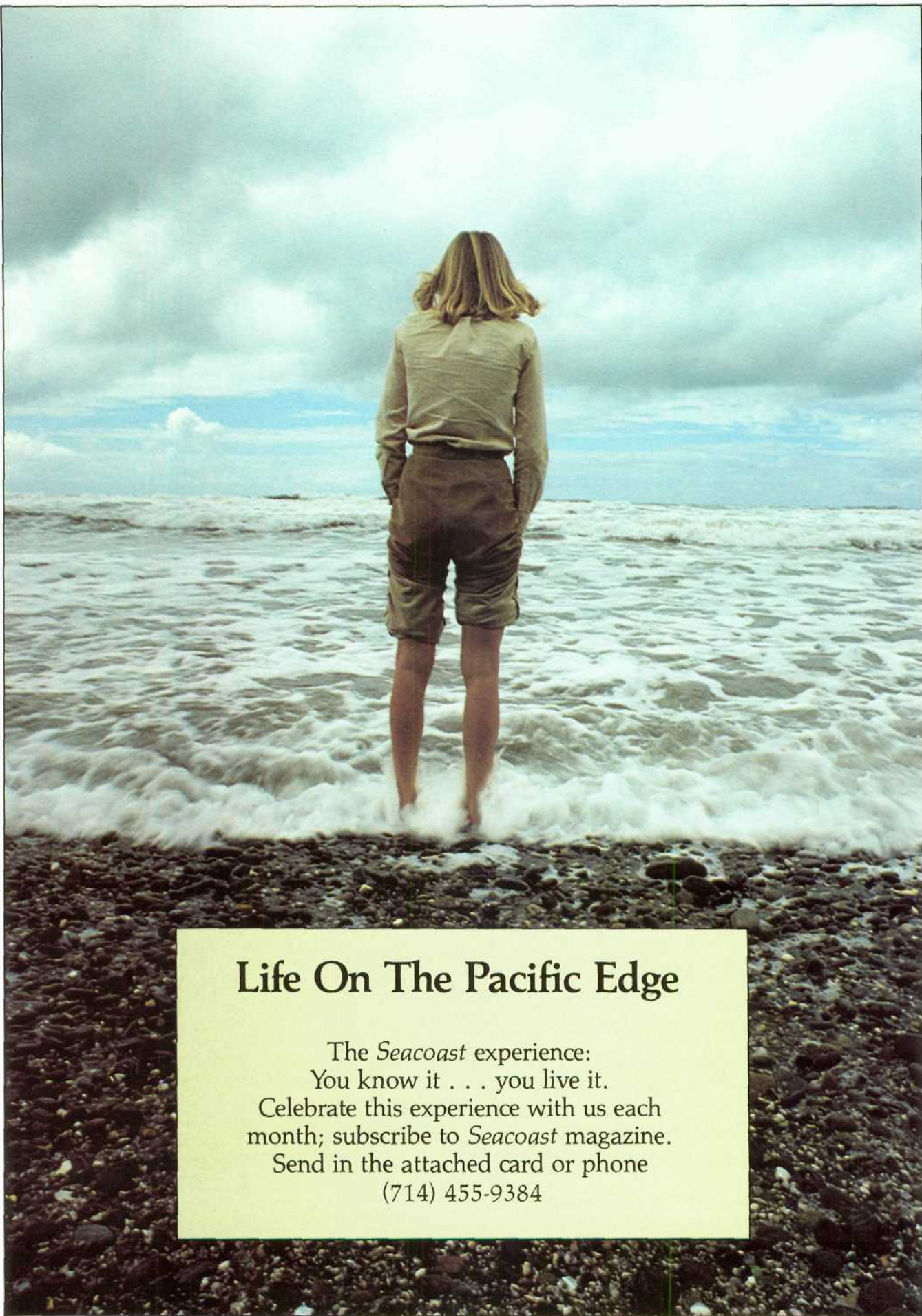
In 1852, the state did recognize the

Spanish crown's Ysleta Land Grant as valid title to the now-American portion of the Tiguas' original acreage. But even this proved largely meaningless as American towns grew up around it, leaving the Indians to till their shrinking fields, to hunt surreptitiously for rabbits and other small game on desert land that had *always* been *theirs*—despite what other folks said.

In 1872, Ysleta del Sur, by then an ethnic mixture of Anglo, Mexican and Indian peoples, became an incorporated town—without the Tiguas' being consulted—and, as such, free to dispose of its public lands as it saw fit. When the town was officially dissolved three years later, it had sold off or politically given away almost all of the Tiguas' crown grant. The Indians were left with nothing but cloudy titles to their adobe hovels—one-half square mile of Indian land—and bitter resentment. Another blow fell in 1955 when El Paso, Texas annexed the Ysleta area, and the Indians suddenly became subject to property taxes amounting to over \$100 per family per year, at a time when the average Tigua family annual income was under \$400.

Since then, the picture has vastly improved. The Tiguas give credit to an Anglo, El Paso attorney, named Tom Diamond. It was Diamond's personal feel for the tribe and his skill in the courtroom that brought the Tiguas to

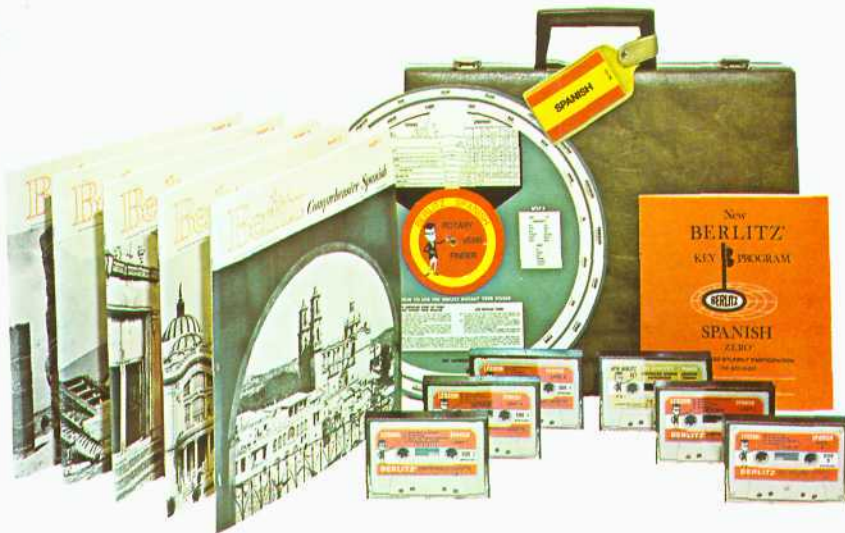
Continued on page 51



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TIGUAS

Continued from page 48

public attention in 1964. That year, Diamond persuaded a Dr. Dunbar, president of the Fields Philanthropic Foundation in New York, to come to Ysleta and see for himself the tribe's deplorable living conditions. Diamond now tells the story with a small touch of humor. "I had carefully explained to the cacique (the ceremonial chief of the tribe) that Dunbar was coming, and that on that day, he should be ready to describe the tribe's major problems."

We cheer life's renewal made grand and grandly patterned through established ceremony.

The day came and Dunbar arrived, and "when I drove him down to the pueblo," Diamond goes on, "the cacique was nowhere to be found. None of the other Tiguas could give any explanation. We waited for two or three hours and were just on the point of driving away—me in red-faced defeat—when the cacique trudged into the plaza, dangling a brace of dead cottontail rabbits over his shoulder. I was amazed at the cacique's apparent unconcern for the importance of Dunbar's visit and I was firm when I said so. But the cacique only replied, 'I have to go hunting. At Hueco Tanks,' and then shrugged, 'Tiguas hungry.' "

Diamond's story ends with the happy report that Dunbar was so struck with this proof of the needs of the Tiguas, he immediately funded the tribe for shoes, new clothes and food.

In March, 1966, Diamond brought the Tiguas to the attention of the National Congress of American Indians (NCAI) meeting in El Paso. Vine Deloria describes the occasion in his book, *Custer Died for Your Sins*, when during the meeting a "man named Tom Diamond appeared before us with a ragged little group of people" and fervently pleaded for NCAI help. Deloria details the occasion's national importance: at that moment, he says, "the modern era of Indian emergence had begun." Until then it had been assumed, by both Indians and whites, that the American Indian's eventual destiny was to merge into white society and disappear. The thought of a tribe that maintains its traditions, socio-political structure and

basic identity within an expanding American city "would have been so preposterous" prior to the discovery of the Tiguas, that the person expounding the thesis "would have been laughed out of the room."

The result has become news again and again in the years that have passed. "Discovery of the Tiguas rocked Indian people in several respects." Far from accepting the demise of their tribe as "God's natural plan for Indians," says Deloria, these people plainly demonstrated that "Indian tribal society had the strength and internal unity to maintain itself indefinitely with an alien culture." Since 1966, "an increasing awareness of tribalism" has swept through the whole American Indian "power structure." Deloria gives Diamond full praise. "Your work with the Tiguas," he says in his autographed note in the copy of *Custer* he gave to Diamond, "was the major turning point in Indian affairs for the last half of the 20th Century."

For all their new national fame, what else accounts for the Tiguas' vitality now? Diamond rates high as one factor, certainly. But, so do financial outlays by such private agencies as the Fields and the Moody Foundations. Official government recognition came late, but when it came vast changes began. In 1967, the Texas Legislature appropriated funds to finance the cost of the Tribal Center, the residential area and a Texas State Government administrative complex. In 1968, President Johnson signed into law United States official recognition of the Tigua people as an authentic Indian tribe. He also transferred to the State of Texas any responsibility the United States might have for them.

These vital factors are great, but in my judgment, the most significant explanation for the Tiguas' new lease on life is their still-abiding conviction that they will preserve and pass on to their children the heritage their forebears passed on to them. I encounter this Indian view each time I visit, and it is more than a hope and a dream.

Today, canny young Tiguas like Tim Baquera, the tribe's arts and crafts director, and Vicente Munoz, the public relations director, typify the community's determination to endure and prosper in ways that are tribally valid. "Like everyone else," these men have told me, "our personal survival depends on our having a solid economic base for ourselves. Beyond us, since Tiguas are no longer farmers, the tribe's survival depends on their featuring their traditional arts and

their crafts and their dances in ways that can—to some strong degree—offer commercial advantage."

Government support and funded research are helping the Tiguas locate and reaffirm their old skills: their pottery and jewelry had become almost obsolete crafts. Now, they flourish as significant paid work for the community's most talented artisans. The art objects themselves, featuring authentic design motifs, pay off in sales in the Center's big store, through mail orders and wholesale arrangements with dealers around the country. Their herb garden features

Though I am an Anglo newcomer here on the Tiguas' ancient preserve, I sense in myself a pleasure in ritual, in tradition main- tained through the long past.

the herbs that their elders have always known held medicinal powers. These herbs, now packaged for sale, bring additional income.

The arts and the gardening support a small number of workers, but more importantly, their products serve as a continual reminder to those other Tiguas—participants in the El Paso job scene—and their families, that to be Tigua means to be tough, long-lived and possessed of an enduring special identity. "We have Indian hearts," their oldest elder sometime ago told a visitor, Stan Steiner. "We will always be Tiguas."

When I visit the Tiguas, I sense a bigger reason for their long survival, a reason touching something I know about me and my people: The fact that since 1607 at Jamestown, since 1620 at Plymouth Rock, since 1849 in the desert in covered wagons, since 1865 at Appomattox; they too have exhibited a long, steady courage, a zeal to hang on and become what their own humanity seems to require.

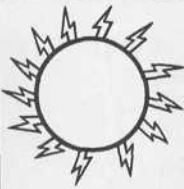
On San Antonio Day in Tigua, I stand in the crowd facing the church, watching the tribal dancers whirl and pivot their ritual steps to the slow beat of the red tribal drum. I watch as other tribe members approach the church doors on their knees, with obvious awe in their faces, and wait with heads bowed while the cacique strikes them on the shoulders with willow wands. It acknowl-

Continued on page 61

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Nov. 5-9: The city of Brawley is holding their 26th annual *Cattle Call*, the Imperial Valley's salute to the beef industry. Events will include a championship rodeo on Nov. 7th and 8th. At 10 a.m. on Nov. 7th, there will be a two-hour parade. Other features for entertainment are: a beef cook-off contest with entertainment, a whiskerino contest and a barbecue dinner. For further information, contact Lew Bacon, Manager, Brawley Chamber of Commerce, P.O. Box 218, Brawley, CA 92227, or call (714) 344-3160.

Nov. 6-8: The Sacramento Mineral Society Golden Harvest of Gems and Minerals Annual Show presents *Our Heritage*. It will be held at Buildings 3 and 4 in the Expo Center, California State Fairgrounds, Sacramento. Hours: 6th and 7th, 10 a.m. to 7 p.m.; 8th, 10 a.m. to 5 p.m. For information, contact Show Chairman David Rosin, 4720 Silver Crest Avenue, Sacramento, CA 95821, or call (916) 486-0168.

Nov. 6-8: The Palms Springs Desert Museum, in cooperation with the University of California Riverside Extension, will be sponsoring a weekend course titled *Mammals of the Colorado Desert*. Two units of credit are given upon completion. Desert naturalist, Jim Cornett presents the course which covers the mammalian fauna of southeastern California, including desert shrews and bighorn sheep. For enrollment information, call University Extension at (714) 787-4105.

Nov. 6-8: The Country Parks Society of San Diego is sponsoring a *Wilderness Weekend/Outdoor Adventure Program*, which concentrates on the various aspects of family camping recreation. This weekend (6th-8th) it will be held at Vallecito in the Colorado Desert. History and nature in the desert will be the main subject. Weekends include a Friday night campfire meeting,

Saturday presentations and hikes, and Sunday concludes with a program focusing on the theme of the weekend. For more information or reservations, call (714) 565-3600.

Nov. 7-8: The Galileo Gem Guild is sponsoring their annual Gems of Land and Sea Show, *Quartz Dynasty*, at the Hall of Flowers in Golden Gate Park in San Francisco. Hours: Saturday, 10 a.m. to 7 p.m.; and Sunday, 10 a.m. to 5 p.m. For further information, contact Margaret MacKenzie, 521 Larch Street, South San Francisco, CA 94080, or call (415) 861-4789.

Nov. 7-8: The Bear Gulch Rock Club presents its 19th annual Gem and Mineral Show at the Masonic Hall, 1025 North Vine Avenue, Ontario, California. The show will feature dealer sales, exhibits, hourly drawings and food. No charge for admission or parking. Hours: Saturday, 10 a.m. to 8 p.m.; Sunday, 10 a.m. to 6 p.m. For further information, contact Don Meirhaeghe, 13267 Miller Avenue, Etiwanda, CA 91739, or call (714) 899-1129.

Nov. 7-8: The 12th annual *Wonders of Nature* gem show, sponsored by the La Puente Gem and Mineral Club, will be held in the Masonic Temple at 170 School Street, Covina. Hours: Saturday, 10 a.m. to 8 p.m.; Sunday, 10 a.m. to 5 p.m. The show includes dealers, displays, special exhibits and food. Admission and parking are free. For more information, contact Jack Kobziff, 14602 E. Danbrook, Whittier, CA 90604.

Nov. 7-8: The Sierra Pelona Rock Club is holding its third annual Gem and Mineral Show at the William S. Hart High School Cafeteria, 24825 Newhall Avenue, Newhall. The show will include 40 displays, a country boutique, dealers and demonstrations on the carving and shaping of gemstones.

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Nov. 14: The *First Benefit Plant Sale* will be held from 10 a.m. to 4 p.m. at the Lummis Home, 200 East Avenue 43, Highland Park. This sale is presented by the Theodore Payne Native Plant Guild for the benefit of the Theodore Payne Foundation for Wild Flowers and Native Plants, Inc. and the Historical Society of Southern California. Features include indoor and outdoor plants for sale, a tour of the gardens and home and refreshments. For more information, contact Mrs. Franz A. Gorges, 740 N. Myers Street, Burbank, CA 91506.

Nov. 21-22: The Nevada County Gem & Mineral Society will be holding their annual show, *Earth's Treasures*, at the Veterans Building, 255 South Auburn Street, Grass Valley. Hours: Saturday, 10 a.m. to 9 p.m.; Sunday, 10 a.m. to 5 p.m. The show will include exhibits, special displays, demonstrations and a club sales table. For more information, contact Emma Rust, 10417 Durbrow Road, Grass Valley, CA 95945, or call (916) 265-5792.

Nov. 21-22: The Silverado Country Fair is a community event where the Old West comes alive. Festivities include country music, recreations of scenes from Silverado's history, arts and crafts booths, and good old-fashioned family fun. Join the community fun in Silverado, located in the Santa Ana Mountains in Orange County. For further information, contact Donna Le Claire, P.O. Box 35, Silverado, CA 92676, or call (714) 649-2747.

Nov. 25-29: The 17th annual Rockhound Round-Up, sponsored by the San Diego Council of Gem and

Mineral Societies, is being held at the Gold Rock Ranch in Ogilby, California. The Round-Up will feature dealers, tailgaters, field trips, auctions and campfire entertainment. Free camp area. For further information, contact Horace Scott, (714) 443-8272.

Nov. 28-29: The Mojave Desert Gem and Mineral Society is sponsoring the sixth annual *Gem & Mineral Show*. It will be held at the Community Center, 841 South Barstow Road, Barstow. Free parking and admission. For more information, contact Bob Depue, 25647 West Main Street, Barstow, CA 92311, or call (714) 253-2954.

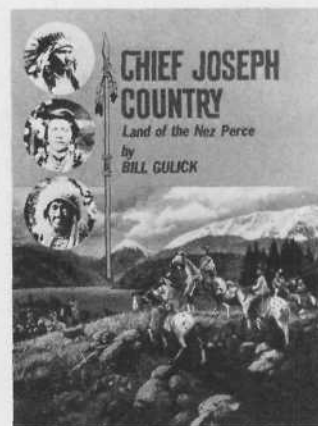
NEW MEXICO

Nov. 1-15: Fall color tours of the Guadalupe Mountains sponsored through the Carlsbad Caverns National park. For information, call (505) 885-8884.

Nov. 6-8: The Southwest Arts & Crafts Festival will be held in Albuquerque at the New Mexico State Fairgrounds, in the Agriculture Building. For more information, contact the Albuquerque Convention and Visitors Bureau, P.O. Box 26866, Albuquerque, NM 87125, or call (505) 243-3696.

The Desert Calendar is a service for our readers. We want to let them know what is happening on the desert. As you can tell, the majority of our features are from California. We need items from all of the Southwestern states, so if you are having an event, or even a year-round activity, let us know. There is no charge for items listed in the Calendar. We only ask that you submit it to us at least three months prior to the event. We (and our readers) want to hear from you.

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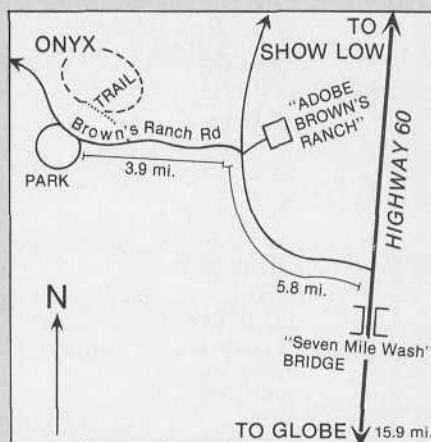
THE DESERT ROCKHOUND

by Rick Mitchell

OBVIOUS ONYX

Collecting Site

I have always enjoyed cutting and polishing onyx. It is relatively soft, easy to work and occurs in a variety of colors and patterns. Because of my partiality, I am continuously on the lookout for new places where it can be obtained. I found out about one such location three years ago, while visiting some friends in Phoenix, Arizona. There were some pieces of nice, solid, banded onyx in their yard, and they told me it had come from the hills north of nearby Globe, Arizona.



Through a visit with a friend, Mitchell found an excellent onyx collecting site near Globe, Arizona.

During the previous year, my friends had been searching for a campsite and came upon a group of rockhounds who invited them to stay for the evening. The rockhounds showed them some of the onyx being collected. It was so colorful and intriguing that they spent the night, and proceeded to join the group the next morning at the digging area.

Needless to say, I didn't hesitate to ask for directions, and a very crude map was sketched for my use. The next morning, with my map and rock pick, I set out to find some of this fine material for myself. Because of the inaccurate mileages on the map, though, it took most of the day to find the spot—but that is one of the things that makes rock-

hounding enjoyable. It affords an opportunity to explore parts of the countryside that most people never see. There is a sense of adventure in searching for minerals while traveling on the often rough, and seldom used, back roads. For me, the search and getting there are as much fun as actually obtaining the specimens.

After finally finding the deposit, I headed up the hill, about 200 yards where the layered onyx could easily be seen. There were pieces of quality material scattered all over, and the colors varied from solid white to those with swirls and bands of red, black, pink, gray and yellow. The prime material must be taken from the seam itself (using gads, hammers and chisels), but the effort is well worth it. If you don't have the stamina to do such labor, there still are many quality chunks to be found on the ground.

If you would like to obtain some of this nice cutting material, go north on Highway 60 from Globe, 15.9 miles, to the bridge crossing Seven Mile Wash. Just past this bridge, a road can be seen heading west. Take it and go 5.8 miles to the ranch sign. Here, you bear to the left and continue another 3.9 miles to the site, where the onyx deposit can easily be seen. It is on the hill, north of the road. There is a clearing on the opposite side, where you can park and set up a camp.

A trail leads to it, and the walk is not bad, but it is steep. While hiking, I kept finding onyx lying on the trail. Even before I arrived at the seam, my collecting bag was completely full and very heavy. When I reached the top, though, the quality seemed even better. I had to go through the traumatic procedure of discarding some of my finds from the trip up. It was necessary to make a number of trips back to my vehicle with bags of this prize material. By the end of the day, I was exhausted, but I had obtained many outstanding specimens: many of which produced very nice, colorful cabochons, bookends and ash-trays.

I am sure that if you have the chance to visit this location, you won't be disappointed. It offers top quality cutting material, in a most beautiful, forested

location and has good camping spots throughout. It is a place especially nice for rockhounds, and I highly recommend it.

Equipment

For those of you who do not like the untidiness of working with polishing compounds when finishing stones and/or metal, Dremel is now marketing rubberized polishing wheels. These tools can be used with any of the Dremel Moto-Tools, and are distributed in sets, depending upon what you are polishing. Among other items, they can be used on most metals, stones and ceramics. For more information, contact Dremel, Division of Emerson Electric Company, 4915 21st Street, Racine, WA 53406.

Lapcraft now produces a series of uniquely shaped diamond wheels. They are called Shaped Diamond Mini-Wheels and are one inch in diameter, designed to be used on a mandrel. They can be employed with most of the hand-held electric tools on the market, and come in coarse, medium and fine grits. The wheels can be purchased separately or in sets, and should offer a greater degree of flexibility to the gemstone carver. If you would like additional information, contact Lapcraft Company, 195 West Olentangy Street, Powell, OH 43065.

Swest, Inc. is now manufacturing a new electric wax pen that will be very useful to those engaged in making wax patterns for rings and other jewelry. It features a wax release valve and trigger that is reported to be more durable and simpler to use than others. There is also a cork handle, for protection of the hands, and a finely machined tip, which produces excellent wax flow. In addition, there is a control unit to maintain consistent flow. A free brochure is available by writing Swest, Inc., 10803 Composite Drive, Dallas, TX 75220.

Publications

The Gemological Institute of America has recently upgraded their publication, *Gems & Gemology*, and I feel it is now one of the finest journals available to those interested in precious stones. The new, larger format features beautiful

color photography throughout. In addition, each issue contains abstracts from other publications in the field, new gem information, lab notes and book reviews. There are also numerous articles covering the entire spectrum of subjects relating to gemstones. This quarterly is one that you will not discard after reading, but, instead, will become a permanent part of your library. An annual subscription is \$16.50, with special rates to students of the institute. If you wish more information, contact the Gemological Institute of America, 1660 Stewart Street, Santa Monica, CA 90404.

Helpful Hints

There have been some articles published that recommend reversing worn diamond saw blades to improve cutting and to increase their life. These recommendations should *not* be followed. The manufacturer designates precisely which way the blade should rotate, and for a very good reason. The diamonds are set in the blade so they face the direction of rotation and are supported, on the back, by metal. If the direction is reversed, the metal will be worn off and the diamonds can become dislodged.

The Wickenburg Gem and Mineral Society suggests using a safety razor as a sander. Simply remove the blade, wrap the sandpaper around the curved end, tuck paper under the teeth and tighten the handle. This has many applications to the lapidary craftsman, especially carvers.

When you are grinding obsidian, always try to go from the center out. Frequently, minute fragments of this volcanic glass will chip off and be picked up by the wheel. This would scratch the interior of the stone, if being worked in that direction. **Z**

Rick Mitchell has been exploring ghost towns and mines and collecting rocks and fossils throughout the Southwest for about 20 years. He has visited hundreds of locations during that time.



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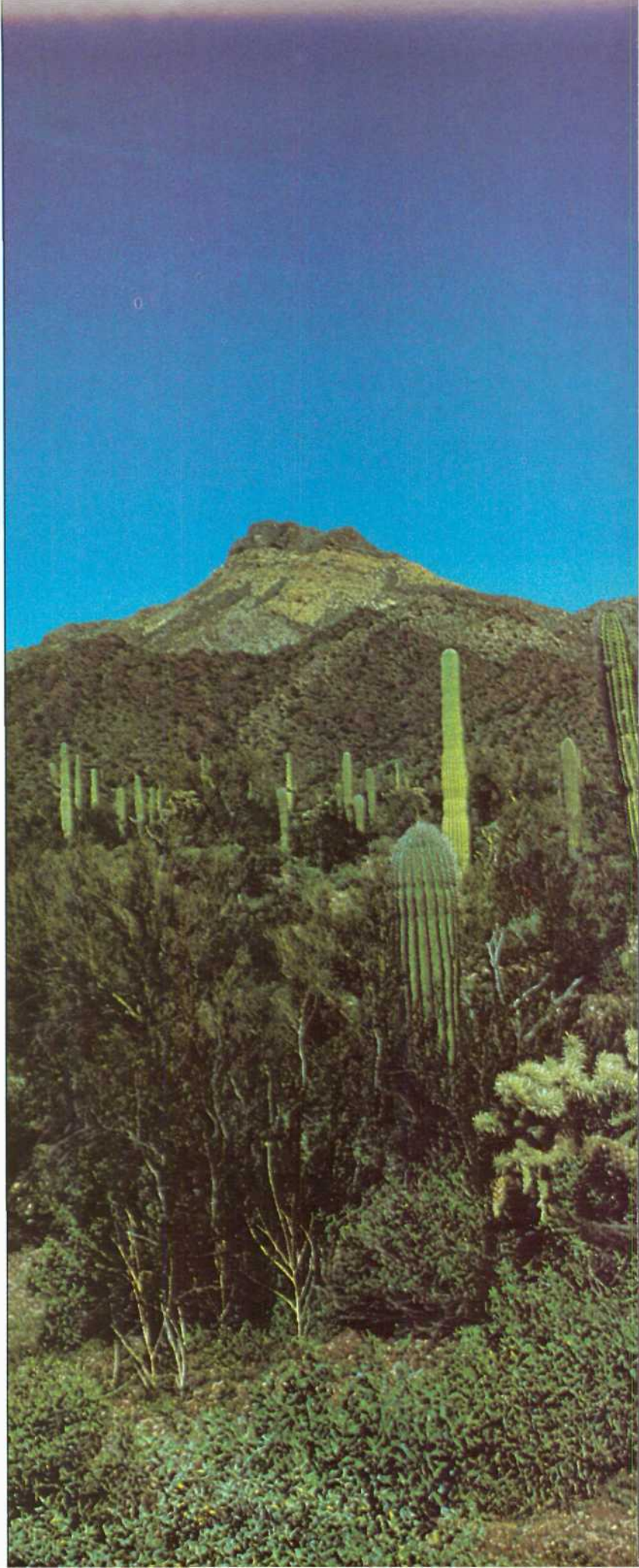
Exploring our desert's
richest natural community.

ORGAN PIPE A Desert Crossroad



*Above: Lupine and Mexican poppies
bloom after a winter rain.*

Text and Photography by
Andrew Steuer III







The senita, old man of the desert cacti.

There's one desert community that is completely self-sufficient, where the inhabitants practice strict water conservation and where no one governs but the elements.

It is, of course, the desert's own natural community. It's out there, along the Beeline Highway heading northeast from Mesa; or at the far end of Speedway in Tucson at the base of the Rincon Mountains. In fact, it surrounds the man-made oases that are Palm Springs, El Paso and Phoenix. Sizable chunks have been irrigated, pit-mined and bulldozed, but compared with the Eastern forests, Midwest prairies or many coastal areas, the desert's natural community is relatively intact. The desert community, however, is one of the most fragile of natural environments. Swelling population, rapid development and the diminishing water situation in the Southwest threaten some of the world's most beautiful and varied desert ecosystems. Fortunately, one of our finest and most remarkable desert areas was set aside as a unit of the National Park system in 1937, assuring its preservation forever. The Organ Pipe Cactus National Monument protects probably our richest desert community.

Organ Pipe is tucked away in southwestern Arizona right on the Mexican border. Within its 516-square-mile confines are several mountain ranges, sweeping coarse-soiled outwash plains called bajadas and vast sandy flats. All of this combines for some of the most spectacular scenery I've seen. Add some of America's most exotic flora to this



magnificent setting and you've got a wilderness area that is unique.

The namesake of the monument is the organ pipe cactus. The organ pipe is one of the largest and most spectacular of American cacti, reaching a height of 20 feet. The many branches grow directly from the base of the plant unlike those of its close relative, the saguaro, which grow outward from a central stem. Rare north of Mexico, it is found in the monument and in a limited area outside: in western Pima and southwestern Pinal counties of Arizona. Along with the organ pipe cactus are many other native Mexican plants; some of which are even rarer than the organ pipe. The reason for this unsurpassed richness and variety of the natural community is the monument's location. Organ Pipe is really a desert crossroad, a place where three of the seven sections of the Sonoran Desert converge. These sec-

tions are recognized by their associated plant life. The California Microphyll Desert, coming in from the west, is named for the small-leaved plants that characterize it, mostly creosote bush and bur-sage. Lush by comparison is the Arizona Upland section, coming in from the east. It's marked by the presence of the saguaro and palo verde community of the mountain foothills. The Central Gulf (of California) Coast Desert, coming up from Mexico to the south, lends an exotic flavor to the scene. Indicators of this desert include the senita, the elephant tree and the predominant organ pipe cactus.

The first time I visited Organ Pipe was during the winter of 1978-79, one of the wettest I've witnessed in the Southwest. The desert floor was covered with grass, thanks to the above-average rainfall, and the place looked like a golf course dotted with cactus. My friends and I decided to take the Ajo Mountain Drive, a 21-mile graded, dirt road loop which winds through the slopes beneath the towering walls of the Ajos—one of the three major ranges in the monument. Diablo Wash, normally dry, was running and the grass became even more profuse as we drew closer to the mountains. At a high spot just beyond Diablo Canyon, known as Birdseye Point, we broke for lunch. On that sunny 70-degree day in January, as we gazed over the verdant Sonoyta Valley and the flowing stream toward the Cubabi Mountains, it seemed to us that no scene could be so inviting, no place so hospitable. It was, of course, a false idyll.

A year and a half after our pleasant picnic, the harsh reality of this desert made the front page. In July, 1980, a group of illegal immigrants from El Salvador was abandoned by their guides after they had crossed the United States border, and were left to fend for themselves in the brutal heat of the desert summer. The Salvadorans were completely unprepared for the rugged Organ Pipe backcountry; some of the women were wearing high-heeled shoes. By the time American authorities became aware of the situation, 13 of the Salvadorans, half of the party, were dead. It was a grim reminder that in the desert community man is the outsider, and the penalty for unpreparedness is severe.

Our first impression was formed under the best conditions possible, and as we made our way along the base of the Ajos, we became more impressed as we rounded each curve. The Ajo range is not especially high but it is extremely

rugged. The Ajos consist of reddish volcanic material interrupted by a yellowish horizontal layer of compressed volcanic ash or tuff. The banded red and yellow sheer rock walls, along with the overall craggy aspect of the Ajos, created a scene as colorful as it was imposing. Still, it was the strangeness of seeing the steep slopes and lofty rock shelves covered with organ pipe cacti that we found most fascinating. We all lived in Tucson and were used to a cactus-studded landscape, but the organ pipe cacti imparted a decidedly Mexican element to the surroundings—unfamiliar yet compelling. When we returned to these mountains a couple of months later, the exotic effect was enhanced by a tremendous spring flower display, a fringe benefit of the wet winter. Carpets of Mexican poppy, lupine, and owl clover stretched out from the base of the Ajos in a most stunning floral extravaganza.

We had scarcely begun the long drive back to Tucson, when we decided to make a return trip to Organ Pipe. Three weeks later, we were back; this time to explore the western side of the monument along the Puerto Blanco Drive. Like the Ajo road, the Puerto Blanco is a loop drive, but at 51 miles, it's much longer than its eastside counterpart. It also takes in some great scenery, although not quite as dramatic as along the Ajo drive. The road skirts the eastern and northern slopes of the second of three major ranges, the Puerto Blancos, and passes within three miles of the third, the Bates Mountains. The road heads southwest, intersecting the Mexican border at Quitobaquito, site of a spring and a large pond. This last stretch passes through a mainly California Microphyll component, a community of about 80 percent creosote bush and bur-sage. We found this simple vegetation and the low, sandy flats along this portion of the loop pretty unexciting, and were glad to see the pond at Quitobaquito with its trees and bulrushes. Because of the reliable source of water in an otherwise parched landscape, the spring at Quitobaquito has an interesting history which is a story in itself (*Desert*, Feb. 1980).

Things picked up for us along the final part of the loop from Quitobaquito on. This last leg parallels the international boundary and heads eastward, side by side with a major highway, Mexican Route 2, just across the border fence. Along here we encountered our first senita cactus. The senita is similar in size and form to the organ pipe cactus, but it has fewer ribs and spines on

its branches. The name senita, "old one" in Spanish, is inspired by the long, whisker-like spines atop the taller stems, which look like gray hair. Often, several senitas grow together in a large clump of older specimens. Like the organ pipe, the senita is found widely in Baja California and Sonora. The natural range of the senita just barely crosses the United States border into Organ Pipe Cactus National Monument. All of the senitas found this side of Mexico are restricted to the vicinity where we spotted our first old one.

**... mountain ranges,
outwash plains and vast
sandy flats all combine for
some of the most
spectacular scenery I've
ever seen.**

Just before the end of the Puerto Blanco loop, a five-mile spur leads northward into an area known as Senita Basin. Many other areas of Organ Pipe are more scenic and dramatic, but it was here we found the strangest desert community of the monument—and probably the most Mexican-like piece of Sonoran Desert north of the border. The bulk of the United States population of senitas, probably fewer than 50 plants, is here. Saguaro and organ pipe cacti are common here also; in fact, this basin is the only location in the United States where our three largest and most spectacular cacti grow together. We walked along a short trail leading up the hillside to a small, but well-formed elephant tree, another rarity. This member of the torchwood family also crosses the international border into the Anza-Borrego Desert State Park in California. Standing next to the elephant tree, we looked over a chunk of displaced Mexican desert, with the Central Gulf Coast element very much in evidence. It was easy to imagine that we were south of the border somewhere near the Gulf of California. Actually, our imaginations weren't that far off. Senita Basin is just a few miles north of Mexico, and only about 65 miles north of Puerto Peñasco, a coastal town right on the Gulf. After taking the spur road back out of the basin, finishing off the last few miles of the Puerto Blanco Drive, we knew we had glimpsed a tiny fragment of a remote bizarre desert community, unknown to most Americans.

The vagaries of climate and topog-

raphy do not recognize the political divisions of man and his governments, and occasionally a conspiracy of natural factors places a constituent element more typical of one country in the territory of its neighbor. Organ Pipe Cactus National Monument is one of these oddball spots. Desert communities are relatively impoverished compared to those of other environments. Within the desert environment itself, however, there is wide variation in the complexity of the natural community from one place to another. Many desert plants have water storing tissue, particularly cacti. That's great for surviving long periods without rain, but such plants are easily damaged by freezing temperatures. At Organ Pipe, hard freezes are infrequent and short enough to permit the growth of some of the more cold intolerant plants, characteristic of frost-free regions further south.

After many visits to Organ Pipe, I still find the exotic surroundings as exciting as I did on the first trip. To me, the fascination of being at a natural crossroad, where deserts converge, never wears off. The thought of these natural forces in balance is a compelling notion. As the desert begins to cool off a bit in the fall, my hiking partner, John Woolridge, and I get out the old topo maps and start planning excursions into the hotter desert areas. We've got plenty of desert and lots of mountains right in our own back yards, but we're always anxious to get back to Organ Pipe. To bona fide desert rats like us, the lure of America's richest and most unique desert community is a strong one. There's a power in the landscape, a strangeness in the plant life and a completeness in the solitude that can transport a person far from the mundane affairs of everyday life. Speaking for myself, sometimes that's just what I need. **D**

Andrew Steuer III began drawing and painting birds in grade school, combining an interest in art with that of nature. In 1973 he received a B.A. in Psychology from La



Salle College, but his parents gave him a 35 mm camera as a graduation present and he's been pursuing a career in photography ever since. He is self-taught in both art and photography. As an outdoor photographer and wildlife painter, he concentrates mainly on the Southwest. He and his wife, Diane, live in Tucson, Arizona.

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TIGUAS

Continued from page 51

edges the fact that their presence testifies their profound contrition for sins committed during the year and their gratitude for blessings they have enjoyed.

On other days, skilled hands roll the red local clay into fat strips and coil it into the slowly emerging shape of a pot. I watch these rites and routines and I ponder.

In that deliberate, watchful process—there is no other way I can say it—something tribal begins speaking in me. Though I am an Anglo newcomer here on the Tiguas' ancient preserve, I sense in myself a pleasure in ritual, in tradition maintained through the long past, in the Tiguas' quiet facial expressions that seem to acknowledge the fact of their own mortality, yet manifest to the world a sense of their own extension in time, both past and future. They are sustained by broader meanings that we clock-ridden folks can't quite perceive in our present dictates and pressures.

At the Tribal Center, in their crafts workshop and herb gardens, the Tiguas welcome visitors. Having just written the word "visitors," I recall something Tom Diamond senses in his contacts with the tribe's oldest man. "You know, according to him," says Diamond, "a 'visitor' is what everybody is, who drops in for a look at the Tiguas. But he doesn't just mean to the reservation, he means to this desert land and this valley. After all, according to things as he sees them, the Spaniards, they came and they went. The Mexicans, they came and they went. And then, the old Tiguas pauses and squints at us Anglo-Americans and says nothing."

Maybe the Tigua elder does have a point about us European drop-ins, who come to snap a few pictures and buy a real Indian pot. But, it could be that he, for all his tribal wisdom, misses a point about himself and all other men.


In the changes that life unavoidably brings to us all, it is the traditional peoples, preserving their myths, crafts and sense of roots that may have the most valuable truths to share with all of us temporary folks, us global visitors.

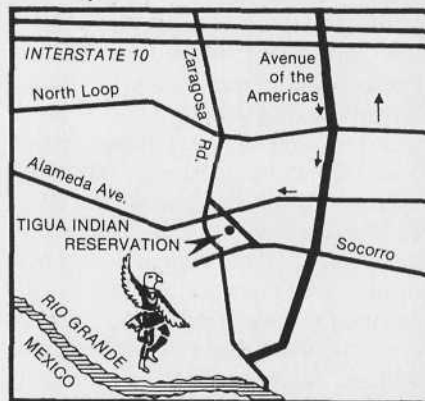
A few months ago, 750 million people watched a simple tribal rite—a family reunion and a wedding, no less—televised to the world. The pageantry, color, music and England's remarkable skills at arrangement and order accounted for much of the pleasure we felt in watching its bride and groom approach the door of its church, pass in

and kneel while its elders declared the young pair the start of a new family unit, inside the tribe.

When England's symbolic new family emerged from the church, we cheered—along with the tribe. Cheering and matching their smiles with ours, we celebrated something beyond one single tribe's unique events. We cheered, I think, life's renewal made grand and grandly patterned through established ceremony.

For 300 years, young and old Tiguas, the brides and grooms, the wearied, the grieved and the deeply contrite have approached the Tiguas' church door and altar, motivated by faith, instructed by ancient mores. Among Tiguas now, I sense a deep hunger still for meaningful order and form in their arts and rites—partly as religious believers, partly as Tiguas—but mostly as human beings sustained by an order that helps them exert some patterned control over time.

Driving back onto I-10, I glance again at the huddled community, dug in and clustered around its plaza. Here in my time and vast everchanging city, I am encouraged to know that the Tiguas still dance—to one ancient drum. 



The Tigua Indian Tribal Center is a mere 10-minute drive from downtown El Paso.

Joseph Leach is Professor of American Studies at the University of Texas at El Paso. His interests beyond teaching involve the Spanish colonial arts, native cultures and lore of the American Southwest and desert and wilderness conservation. His travels have taken him to the Far East—meaning Connecticut (for a Yale Ph.D.) and Japan for army service after World War II—all the countries of Europe, Mexico and North Africa. His travel plans now point him south, for the Amazon and Cape Horn.



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stalks that emerge from the sand, and long fleshy stems which extend several feet deep where they attach to the roots of nearby shrubs. Tapping in on a well-established host appears to be an effective adaptation for survival in a harsh environment. In my opinion, sand food is one of the strangest plants in North America. The flower heads look like fuzzy mushrooms or gray powder puffs bearing numerous tiny lavender flowers. I have traced the scaly stems of sand food for at least five feet before finding their junction with the host root. Trying to dig in the soft, dry sand is very frustrating because it caves in as fast as you can shovel it out. I finally got smart and returned during the rainy season, when the sand was damp and compacted, to find the host connection. Sand Papagos and Cocopas ate the fleshy stems, and I must admit they are rather tasty. To me, the flavor of raw stems is pleasantly sweet, with a texture similar to a crisp, juicy radish. However, this is a rare desert plant and should not be sought after by hungry nature lovers. Precisely how the seedlings of these unusual plants are able to find the host root buried deep in sand is still not known.

"They are just piles of sand devoid of plants and animals," some say. Nothing could be further from the truth.

Many people have asked me why sand dunes should be preserved; "they are just piles of sand devoid of plants and animals." Nothing could be further from the truth. There are hundreds of dune species throughout the southwest, some of which are considered rare and endangered by the United States Fish and Wildlife Service. This is because their limited and specialized habitats are threatened by urbanization and various motorized off-road vehicles. In addition, some sand dunes have unique habitats that occur in no other dune chains. For this reason, the Bureau of Land Management has closed a section of the Glamis dunes north of Highway 78 in Imperial County, California to all motorized vehicles. This area has been designated a National Natural Landmark, and only represents a small

part of the enormous Algodones Dunes, most of which are still open to off-road vehicles. This section was to insure that at least one section of this magnificent chain of sand dunes will remain in its pristine form for educational activities and field research; for photographers, naturalists, scientists and anyone who enjoys accessible, picturesque dunes.

Enormous piles of sand are an attractive recreational outlet. There is no doubt that riding over sand dunes is great fun; however, I am thoroughly convinced that there must be a compromise. The fragile root systems of dune plants are easily destroyed by the spinning wheels of dune buggies, not to mention the destruction of dens and burrows of dune mammals. Representative dune areas with unique flora and fauna should be protected from vehicular use in order to preserve rare endemics, such as the Antioch dune primrose, Eureka dune grass and the remarkable sand food.

I truly believe that sand dunes are one of the most beautiful and remarkable of all the earth's natural phenomena. The complex geological factors resulting in the formation of dunes and their subsequent colonization by plants and animals are absolutely amazing. Sandstone formations, formed by ancient dunes, often reveal many mysteries about the geologic history and weather patterns of a region. I am in awe when I stand before an enormous, gleaming white sand dune and realize that all of this was once an ancient lake bed or coastal plain. The incredible roaring sounds of distant dunes is an unforgettable experience, particularly during the quiet hours of darkness and daybreak. Starting with the wind and tumbling particles of sand and culminating in picturesque drifts of rippled sand with an entire, dynamic, living community of plants and animals; this is one of nature's most remarkable cycles—and is truly a phenomenon of wind. 

Wayne P. Armstrong teaches biology and botany at Palomar College, San Marcos, California. He conducts ecology field trips to the mountain and desert areas of Southern California. He also writes articles for Environment Southwest (San Diego Society of Natural History), Fremontia (California Native Plant Society) and Pacific Discovery (California Academy of Sciences).



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